



Winning against seeds

Management tools for your sheep enterprise

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Introduction

Winning against seeds provides Australian lamb and sheepmeat producers and their service providers with essential tools to produce 'seed-free' products. It identifies problem grasses and weeds, quantifies their impact on the industry and provides practical solutions for producers to address this problem.

Producers who win against seeds:

- Identify problem plant species and are familiar with their time of flowering and seed set
- Determine the cost of seed contamination to their business
- Explore available seed reduction and seed avoidance strategies
- Determine the most cost effective and profitable strategies for their production system
- Obtain feedback from processors and monitor, review and improve their management strategies

Common seed management strategies include:

- Grazing management (stocking density, feedlotting, grazing rotation)
- Livestock management (time of lambing, shearing)
- Agronomic management (pasture manipulation, sown fodder crops, fodder conservation)
- Target market and time of turn-off

There is no single management strategy that can be applied to all situations. Every situation is different, and it is important to look at all the management options available. Successful producers develop an integrated approach to tackle grass seeds that is suited to their property and business goals.

To control problem grasses in the short-term, producers make a start on one or two paddocks, rather than the whole farm. This usually provides enough feed to finish weaners or carry them through to stubbles and other feeds.

Although grass seeds threaten livestock for only a few months of the year, controlling them needs to be a year-round focus. There is always something to consider in relation to grass seed management in a sheep enterprise, regardless of the time of year. Thinking about

grass seeds only during the risk period will not control the problem in the long-term.

The key to winning against grass seeds is to take ownership of the problem and take action.

Processors and skin buyers are keen to support and work with producers and agents who are prepared to 'have a go'. They offer trial seed kills and formal feedback on lines sold over-the-hooks to ensure producers are paid for what they produce, no matter what district they come from.

The enthusiasm from the whole of industry is there to reduce the incidence of seed in lamb and sheepmeat and *Winning against seeds* is a must read to help you get started.



Premium quality lamb is our target

The issue

Processor impact

The cost of grass seeds to the Australian Prime Lamb industry is enormous and these costs are borne by both the processor and producer.

Processors face costs as seedy lambs create production inefficiencies along the slaughter chain and in the boning room including:

- Reduced throughput – frequent slowing or stopping of the chain causes fewer animals to be slaughtered and processed in a day
- Extra labour – seedy carcasses both on the slaughter floor and in the boning room can require twice the labour to process
- Downgraded product – contaminated carcasses are generally downgraded from a high value chilled product to a low value frozen product; legs alone can be discounted by \$10–15 per carcass
- Reduced meat yield – slaughter floor trim of seedy carcasses is often extreme in a bid to eliminate any seed entering the boning room
- Market claims – isolated seeds that are not trimmed lead to compensation claims from end users and loss of consumer confidence.

“Seed infestation continues to be the biggest single issue facing the prime lamb industry. On-farm livestock purchase now represents a major component of our supply, to improve quality assurance from paddock to plate. Purchasing lambs ‘over-the hooks’ ensures producers obtain feedback on many issues, including seed infestation.”

Andrew Hay,
Coles Supermarkets.

The total cost to the processor of heavily seed infested lambs can be up to \$30 per head.

Processors do not necessarily look for the amount of seed on the carcass, but where the seed is positioned, with the greatest impact coming from seed damage to the primal cuts such as the hind leg and loin areas. These cuts are high value and consequently their damage has the greatest impact on total carcass returns. Seed infestations of only one or two seeds in these areas can cause the carcass to be downgraded.

However, if a large proportion of a mob has heavy seed infestation in a low value cut area, like the brisket or belly region, the processor incurs significant losses due to frequent stopping to trim contaminated carcasses.

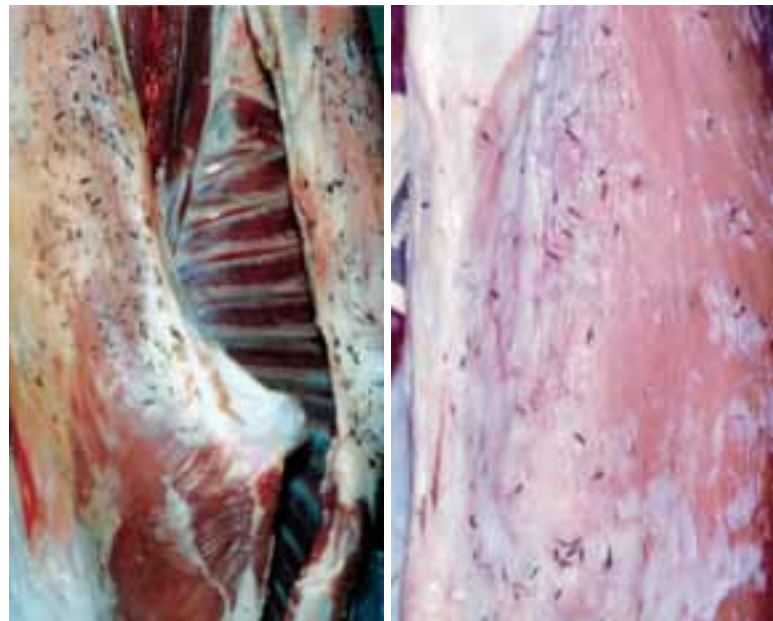
Producers also lose when their lambs are contaminated with grass seeds. All carcasses infested with seeds are trimmed, reducing total carcass weight and attracting a trimming discount of up to \$1.50/kg.



Carcass trimmed for grass seeds

“It is my view that generally there is a poor understanding of this problem and more work needs to be done. Processors have continued to deal with the issue and in many cases absorb the losses. Producers need to be more accountable for this problem and united we can minimise the losses. The option of seed trials are still available with our company, however once the seed problem has occurred it is too late. Spring is the danger time and awareness and good management is the key.”

Dale Cameron
JBS Australia



Carcass damage from small black seed heads

Seasonal conditions play a significant part in the problem. Some areas may go for a number of seasons without a problem and then with ideal winter conditions and high levels of seed set, the problem reappears. The contamination generally occurs in spring, but can show up in the carcass at any time of the year.

The ability of growers in traditionally ‘bad’ seed areas to manage their seed problem has been proven with regular out-of-season deliveries achieving seed-free results. Understanding the risk and managing the problem is what it is all about.

Some basic rules may help to understand the issue and short circuit the problems:

- Depending on seed type, generally shearing does not alleviate existing grass seed penetration, although shearing before seed set may reduce contamination
- Processor experience suggests no breed is immune from seed damage
- Critical months to manage for seed pick-up are October to January
- Summer rain will help soften seed and shorten the danger period
- Spray topping or target spraying will help, but remember your shelter belts, isolated trees, gullies, fence lines, laneways, yards and holding paddocks
- If you are unsure of a paddock, use the sock test, if you are getting seeds in your socks you will be getting seeds in your lambs.

Impact on skins

Grass seed damage is by far the most widespread and serious problem found in lambskins today. Grass and weed seeds are picked up in the wool and then enter the pelt in a matter of days, producing puncture marks, scarring on the flesh side of the skin and abscesses. Scars created by seed do not absorb dyes and show up as pale spots on the pelt once it is tanned. Heavy pigments are required to disguise the affected areas of the skin, downgrading overall value. As well as damaging the pelt itself, removing grass seed from the wool is difficult, costly, and in some instances impossible, as woolskins cannot be scoured or carbonised.

Barley grass, spear grass, brome grass, corkscrew (geranium), mitchell grass and silver grass are the most common offenders found in Australia. Grass seed affected skins are mostly unsuitable for the premium double-face wool-on garment and leather manufacturing

markets. With reduced marketing options available to skin merchants and processors, seed affected skins return far less than skins that are free of grass seed and vegetable matter contamination.

New season sucker lambskins can be discounted by as much as 50% for grass seed penetration and vegetable matter contamination of the wool. New season lambskin prices are generally higher as some manufacturers use spring lambskins to purchase their entire annual requirements over only a few months.

Skins are a valuable product to the lamb industry and make a significant contribution to the total return on livestock. Although there has been a great deal of work in the past to reduce the percentage of seed affected animals, there is still much to be done.

Paul Fitzsummons
PFK Sheepskin Valuations



Severe skin damage due to grass seeds



Seed contamination and damage in a processed lambs skin

On-farm losses

Grass seed contamination impacts on farm income by reducing sheep growth rates and health, and lowering wool, skin and carcase values.

Sheep that become infested with seeds from grazing problematic pastures, and which are relocated to seed-safe pastures, can remain contaminated for over two years, although the level of contaminating seeds is reduced rapidly over the first six months. This has long term implications for both health management and growth and for feeder lamb buyers.

Reduced wool production and value

Grass seeds and awns increase the shive content of wool, resulting in vegetable matter discounts and lower wool value. Wool production and quality also suffer when sheep become blowfly struck from grass seed irritation, or when they bite and rub the wool, resulting in discounts for cotted wool.

Wool type influences the amount of seed picked up and the degree of skin and carcase contamination.

Merino types are most severely affected, followed by Downs types and then Romneys, while Border Leicesters have the lowest contamination rate. Fibre diameter has little impact on the contamination rate.

Skin and carcase damage

Grass seeds in wool can cause skin damage within days by penetrating the skin, causing puncture marks, scarring and abscesses. Pelt damage results in the skins being unsuitable for the wool-on garment and leather manufacturing markets. Grass seed contaminated skins are discounted by as much as 50%.

Contaminated carcasses also lose up to 50% of their retail value, with 4–5kg being trimmed from heavily infested carcasses.

Weaner ill-thrift

Eliminating the problem species from paddocks endemic with seeds can double lamb growth rates. Wool production also increases when problem species are controlled.

Lambs in seedy paddocks will experience a sudden check in growth rates during mid to late spring and early summer in annual grass seed pastures, and during summer to autumn in perennial grass seed pastures, coinciding with periods of peak seed dispersal.

Young sheep and lambs contaminated with seeds can become too sore to move and suffer damage to their eyes, ears, feet and mouths. Seeds can cause death through bacterial infection, tetanus and fly strike. As few as 25 seeds in a lamb can reduce postweaning daily liveweight gain by up to 50%. In severe situations, especially in spring-born lambs, many lambs become mismothered and die of thirst or starvation, with reported losses as high as 30%. Lower weaning weights and reduced post-weaning weight gains have been shown to cause increased mortality in weaner sheep.

As well as causing irritation and severe damage, many grass species – such as silver grass, spear grass and wire grass – also reduce carrying capacities and feed quality unless kept in their vegetative state.



Image source: Karl Behrendt, Agrorum Consulting

Severe seed contamination.

Indirect costs

Producers can attract indirect costs associated with seed contamination if potentially inefficient avoidance strategies, such as premature shearing and earlier lambing, are used to deal with seed problems. The benefits of such strategies in seed management need to be weighed up against potential production losses and price discounts that may be incurred, in addition to the advantages of alternate management strategies.

Premature shearing can result in length discounts on the finest fleece Merinos will produce in their lifetime and this cost needs to be considered when comparing alternative strategies. Similarly, an earlier lambing may result in lower production per hectare and higher supplementary feeding requirements.

Additional long-term costs related to reduced carrying capacity from not maintaining suitable pastures should also be considered.

Maintaining areas of improved seed safe pastures and lambing during late winter or spring will deliver higher total production per hectare while tackling the seed problem proactively.

Karl Behrendt, Agrorum Consulting

Parts of this article and further contributions by Karl Behrendt, are based on information published in the magazine Farming Ahead and reprinted with kind permission of Kondinin Group.



Grass seed penetration of the face and eye

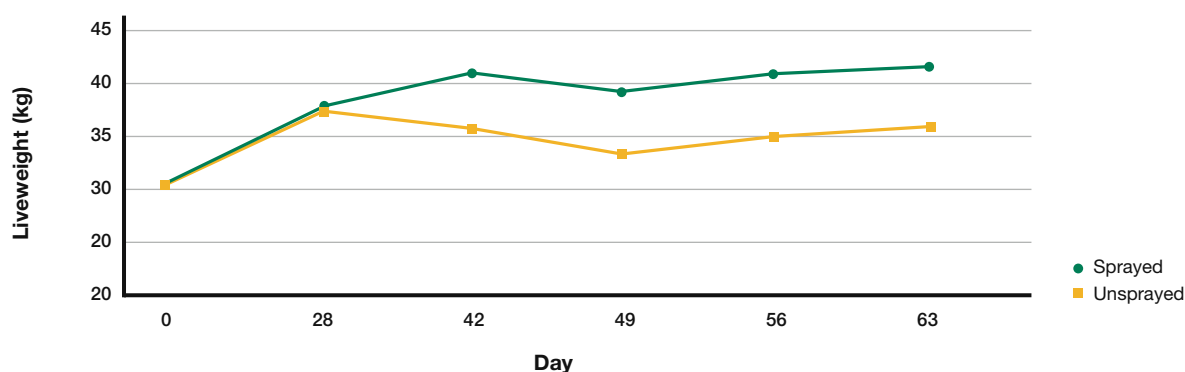
Effect of grass seeds on spring production

Results from a trial at the Turretfield Research Centre, South Australia, illustrate the dramatic impact grass seeds (mainly barley grass) can have on Merino lamb production. A comparison was made of the performance of lambs grazed on pastures sprayed to control grass seeds (350ml/ha Fusilade® during September) and lambs grazed on unsprayed pastures.

Grass seed contamination of lambs grazed on the unsprayed pastures resulted in:

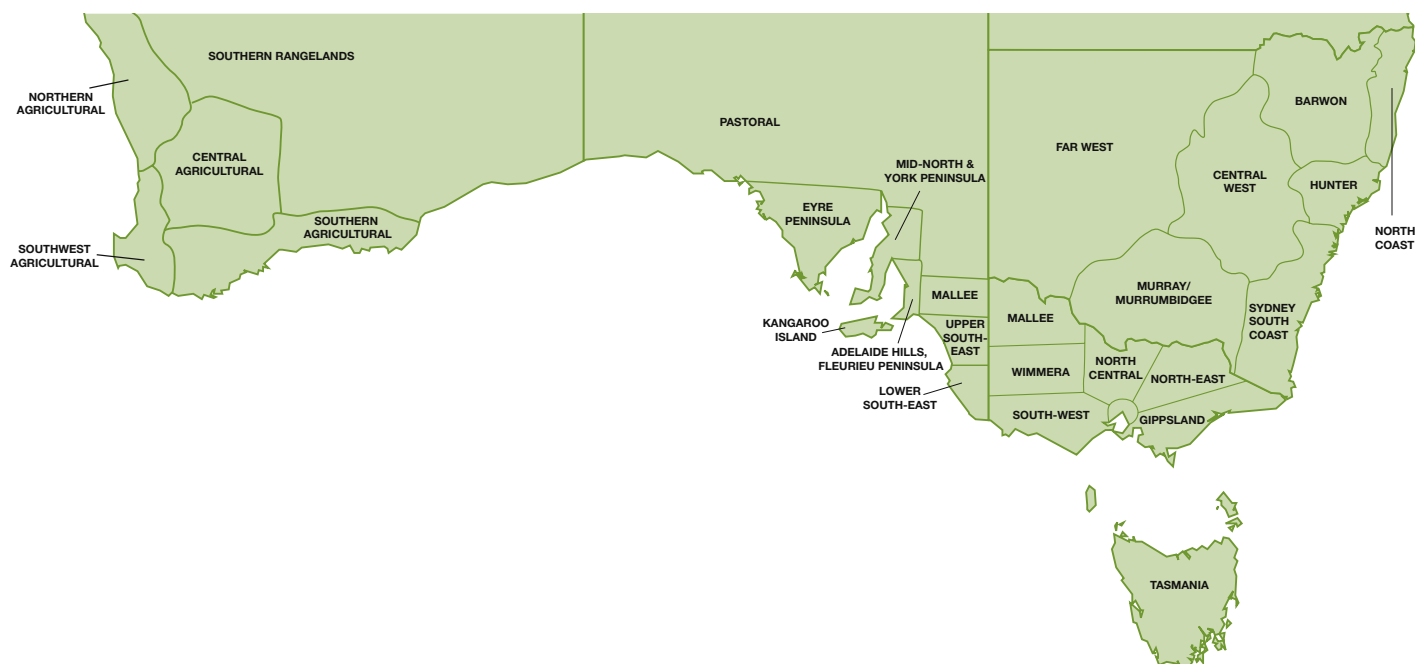
- Reduced growth rates – bodyweight down 6kg
- Damaged pelts
- Carcase weight reduced by 2.4kg
- Carcase value reduced by 78%

Lamb liveweight gain on sprayed or unsprayed pasture



SOURCE: Little DL, Carter ED, Ewers AL (1993), Wool Tech. Sheep Breed, 41, (4), p369–378

Problem weeds



Location guide

	Barley <i>Hordeum leporinum</i>	Brome <i>Bromus spp.</i>	Chilean <i>Nassella neesiana</i>	Erodium <i>Erodium spp.</i>	Silver <i>Vulpia spp.</i>	Spear <i>Austro- stipa spp.</i>	Wire <i>Aristida ramosa</i>
New South Wales							
Far West	X			X		X	X
Barwon	X	X	X	X	X	X	X
North Coast			X				
Hunter					X	X	X
Central West	X		X	X	X	X	X
Murray/Murrumbidgee	X	X	X	X	X	X	X
Sydney South Coast	X	X	X		X	X	X
Victoria							
Mallee	X	X		X		X	
Wimmera	X	X	X	X	X	X	
South West	X	X	X	X	X	X	
North Central	X	X	X	X	X	X	
North East	X	X	X	X	X	X	X
Gippsland	X	X	X		X	X	X
South Australia							
Pastoral	X	X		X	X	X	
Eyre Peninsula	X	X		X	X	X	
Mallee	X	X		X	X	X	
Mid-North and Yorke Peninsula	X	X		X	X	X	
Upper South-East	X	X		X	X	X	
Adelaide Hills, Fleurieu Peninsula, Kangaroo Island	X	X	X	X	X	X	
Lower South-East	X	X		X	X		
Western Australia							
Northern Agricultural	X	X		X	X	X	
Central Agricultural	X	X		X	X	X	
Southern Agricultural	X	X		X	X		
South-West Agricultural	X	X		X	X		
Tasmania	X	X		X	X	X	

Barley grass – *Hordeum leporinum*



Source: Rod Randall



Barley grass: Left – whole plants of *Hordeum leporinum*. Top right – seed heads. Bottom right – Barley grass seeds.

Barley grass is an annual species renowned for germinating in autumn to provide valuable stock feed soon after breaking rain. It is more dominant on sandy loam soils in the winter rainfall (southern) areas of the cropping belt. The awned seeds in pasture, hay or silage may cause eye injuries, reduced live weight gains, carcase contamination, mainly in lambs, and a reduction in wool quality.

Management

There are several options to control barley grass both in pastures and crops. In the pasture phase of a cropping rotation:

- Selective grass **herbicides** (Group A) applied early in the growing season will remove barley grass. This can also benefit the subsequent cropping phase. However it is only recommended when there is a background of desirable pasture plants, such as annual medics or clovers, as a lack of groundcover may be an erosion risk.
- **Grazing** early in the season, to assist with a more even seed maturation date, in conjunction

with **pasture topping** (glyphosate at early seed development) or **spray topping** (paraquat at the milky dough stage of seed development) can be used to limit barley grass seed set. However it can also reduce the seed set of desirable pasture plants. Contact your local herbicide reseller for further information on which herbicide may be appropriate for your situation.

In the cropping phase of the rotation:

- Barley grass populations can be reduced by either applying non-selective broad spectrum **herbicides** or **cultivation** prior to crop establishment. However, there is always a risk that barley grass plants have not fully emerged at this time.
- **Clearfield®** technology is available to selectively remove barley grass in cereal crops. This technology offers field crop varieties that are specifically bred to be tolerant to Intervix® chemical.

Roy Latta

South Australian Research & Development Institute

Brome grass – *Bromus diandrus*



Brome grass: Above – Mature Great brome (Bromus diandrus). Top right – Bromus diandrus seed head. Bottom right – Seeds of Bromus diandrus.

Source: Charles Sturt University

Source: DPI Victoria

Great brome is an annual grass species widely distributed on the sandier soils of southern Australia. The seeds can contaminate and injure sheep through penetration of eyes, mouth, feet and skin. *Bromus rigidus* (rigid or red brome) is another common species with similar animal welfare issues. Both species are also known as ripgut brome.

Management

There are options to control brome grasses both in pastures and crops. In the pasture phase of a cropping rotation:

- Selective grass **herbicides** (Group A) applied during the growing season will remove brome grass. Ensure that a full germination has occurred following a cold wet period prior to spraying. Selective control is only recommended when there is a background of desirable pasture plants, such as annual medics or clovers, as a lack of groundcover following grass removal may be an erosion risk.
- **Pasture topping** (glyphosate at early seed development) or **spray topping** (paraquat at the milky

dough stage of seed development) can be used to limit brome grass seed set. Brome grass is quite unpalatable, apart from very early in the growing season, therefore grazing can only provide a minimal benefit in achieving a more even seed maturation date. Contact your local herbicide reseller for further information on which herbicide may be appropriate for your situation.

In the cropping phase of the rotation:

- Brome grass requires cold temperatures prior to germination. Therefore applying non-selective broad spectrum herbicides or cultivating prior to crop establishment in May often does not control brome grass establishment.
- **Clearfield®** technology is available to selectively remove brome grass in cereal crops. This technology offers field crop varieties (wheat, barley and canola) that are specifically bred to be tolerant to Intervix® chemical.

Roy Latta

South Australian Research & Development Institute

Chilean needle grass – *Nassella neesiana*

Source: Charles Grech



Source: Charles Grech

Chilean needle grass: Above left – pasture invaded by Chilean needle grass. Above right – Seed head of Chilean needle grass showing the distinctive purplish glumes and long awns. Bottom right – Seed of Chilean needle grass showing the distinctive ring of hairs that resembles a raised crown or ridge of small teeth (the corona).



Chilean needle grass (*Nassella neesiana*) is a perennial tussock-forming grass native to South America. Since its introduction in the 1930's, it has become a serious environmental and agricultural weed throughout NSW, ACT, Victoria, Tasmania, South Australia and south-east Queensland. Its potential range also extends to southern Western Australia. The panicle seeds readily attach to stock, particularly sheep, and can cause injury by burrowing into skin, muscle and eyes. Its presence in wool can be a major cause of downgrading.

Identification

Chilean needle grass looks very similar to many native *Austrostipa* species (often known commonly as spear grass). It can be distinguished from these by the panicle seed, with its distinctive purple glumes and the presence of a corona – a band of hairs around the base of the seed where it attaches to the awn. In addition to panicle seed, and unlike most other grasses, it produces seeds (cleistogenes) within the stem and at the base of the plant.

Management

There are several recognised management techniques which include manual removal, chemical control, fire, grazing and in some circumstances, cropping. An integrated, long-term management program that utilises several of these techniques will be most effective at

controlling Chilean needle grass. Management options are discussed in detail in the *Chilean needle grass national best practice management manual* (see 'Further Reading' in the Appendix).

To minimise the risk of Chilean needle grass:

- Ensure sourced fodder and grain is not contaminated with Chilean needle grass
- Avoid introducing stock from properties with Chilean needle grass infestations
- Remove stock from infested paddocks before seed set
- Kill or remove the entire plant to prevent the spread of seed; where infestations are small, remove the whole plant by hand
- Ensure all machinery, equipment and materials are cleaned when moving from infested to clean areas
- Check and clean machinery and equipment coming onto your property, including inside vehicles, boots and clothing and dogs
- To minimise weed spread, restrict the movement of stock infested with seed.

Matt Sheehan
Wild Matters Pty Ltd

Erodium spp.

Source: Vic DPI



Source: Royal Botanic Gardens Sydney



Source: Vic DPI

Erodium spp.: Above left – Flower and seed head of *Erodium botrys*. Inset – Flower and seedhead of *Erodium cicutarium*. Top right – *Erodium cicutarium*. Bottom right – *Erodium botrys* seeds.

***Erodium* spp.** – *Erodium botrys* and *Erodium cicutarium* are known by many common names nationally including Storksbill, Crowfoot, Heron's bill, Corkscrew and Wild Geranium. They are some of the most prevalent broadleaf weeds of dryland and irrigated pasture systems in southern Australia's 400mm+ rainfall zone. *Erodium* is a winter growing annual which germinates after good late summer or autumn rains and is most prevalent in poorly competitive pastures in lower fertile sandy-clay loam soil types.

Erodium is very tolerant of dry conditions, and therefore is more difficult to manage where an early autumn break is followed by weather conditions which are dry enough to kill or severely set back desirable germinated clovers. In early spring under favourable conditions, *Erodium* plants are able to rapidly flower and set seed.

Erodium plants generally dominate areas that are bare at the autumn break, hence they are often found in paddocks where hay has been cut, with poor, low fertility soils, with pastures with very low levels of perennial grasses that would otherwise provide competition, around stock camps and in paddocks that have been overgrazed. *Erodium* grows slowly over winter and provides little feed for stock with low nutritional value. In late spring, as the plant dies, the

seedheads split into a number of sharp spikes which twist into a spiral or corkscrew. As livestock brush against the plant the seed detaches from the plant and adheres to the wool. Once attached to the wool, the corkscrew helps the seed work its way into the animal's wool and skin.

Management

The control strategies are best used in combination to reduce the prevalence of *Erodium* in the pasture;

- Increase **soil fertility** to improve pasture establishment & competition.
- Establish a **dense competitive annual or perennial pasture** by sowing earlier maturing varieties of clovers which have a high seed yield and hard seed content, or sowing a dense perennial based pasture.
- **Herbicide** spraying is most effective when the target weed is at the small rosette stage and not under environmental stress conditions such as frost. Spray grazing is another management approach to help control *Erodium* in established perennial pastures.
- Use appropriate **grazing management** strategies such as rotational grazing to maintain competitive pastures.

Craig John
Landmark

Silver grass – *Vulpia* spp.

Source: Tiffany Bennett



Source: Grant Staher



Source: Vic DPI

Silver grass: Above – *Vulpia fasciculata*. Above right – *Vulpia myuros* seed head. Bottom right – *Vulpia fasciculata* seeds.

Silver grasses (*Vulpia* spp.) are annual weed grasses widespread in pastures throughout southern Australia. Common species are sand fescue (*V. fasciculata*), squirrel tail fescue (*V. bromoides*) and rats tail fescue (*V. myuros*). *Vulpia* causes huge losses annually in the sheep industry through reduced livestock carrying capacity of pastures and suppression of growth of other pasture species. The seeds of silver grass are a significant source of wool contamination and skin damage and can seriously injure livestock by penetrating the skin and lodging in feet, eyes, ears and mouths.

Management

Vulpia is a prolific seed producer resulting in densities of 10,000 plants/m² having been measured. In addition, it has a staggered germination, germinating right through winter, especially on non-wetting sandy soils. It has no hard or dormant seeds. Most seed will germinate in the first year, so **any control technique that prevents seed production** is worth while. With any treatment only a few *Vulpia* plants have to escape to cause problems in the following year. Therefore, a multi-pronged attack is needed, as well as a two year control program. After that, constant vigilance is required to prevent *Vulpia* quickly getting out of hand.

Techniques worthy of consideration include:

- **Grazing management**, including heavy grazing in spring to reduce seed set. This is best done by

spelling the paddock for a period (20-30 days) before flowering to allow all tillers to produce a seed head, then grazing with high stocking pressure (100 dse/ha) whilst the heads are still in the boot;

- **Spray topping** in spring can be effective but keep in mind the staggered germination, so *Vulpia* plants will be flowering over a long period;
- **Herbicides**—Trifluralin used with lupin and cereal crops is effective, along with triazine products used with TT canola. Triazines can carry over into the next year and affect pastures. Read the label. There are also products to selectively take *Vulpia* out of lucerne or any legume pasture, but they are very expensive;
- **Winter cleaning** with simazine and/or paraquat works well in sub clover/perennial grass based pastures and lucerne. Winter cleaning is the best way of almost eliminating *Vulpia* in one year. Simazine is a triazine product. Read the label.
- Cutting pastures for **silage** can help, provided it is done early. Seeds can be destroyed by the process. Hay making is not so effective as the seeds will mature in the windrow before baling;
- **Claying sandy paddocks** lifts the germination and competitive ability of desirable pasture species, enabling them to outcompete silver grass. The clay spreading process also buries *Vulpia* seeds.

Tim Prance

T Prance Rural Consulting

Speargrass – *Austrostipa* spp.



Source: Harry Rose



Source: Lowan Turton

Speargrass: Left – mature *Austrostipa scabra* plant. Centre – Seedhead of *A. scabra*. Right – Seeds of *A. scabra*.

Speargrass (*Austrostipa* spp.) or corkscrew grass, belongs to a group of native perennial grasses that are recognised by a sharp single awned seed. Rough Speargrass (*Austrostipa scabra*) is widespread across the southern half of Australia. There are 60 recorded species of speargrass occurring in all states. These are tufted grasses generally ranging in height from 50–150cm. Speargrasses are year-long green perennials which respond to rain at any time of the year and are often the only green feed in native grass paddocks in dry winters. They are not readily eaten by livestock as forage quality is low.

Speargrass seeds are sharp and will damage eyes and mouths and contaminate wool and carcasses of sheep. It appears all species have the potential to cause damage when they become a large proportion of the pasture and grazing livestock cannot avoid them.

Management

There have been no major studies on speargrass management, so information is based on smaller research projects and observational studies.

Grazing management of speargrass aims to keep the plants small with minimal dead material in the tussocks. In winter and early spring, following rain, speargrass

is often the only species in native pastures producing green feed of moderate quality. Speargrass becomes attractive to livestock in these situations and its size is reduced by grazing. The grazing action of livestock can pull out parts of the plants reducing their size.

Speargrass will thrive in situations where it is lightly grazed or is in long rotations. When ungrazed, the plants get bigger and the resultant overburden prevents regrowth of new leaf and they become unattractive to livestock. This is when speargrass can dominate paddocks.

Pasture improvement, where it grows on better soil types, will reduce its dominance in the pasture as it is not very competitive or responsive to increasing levels of fertility. Many of the speargrass species only grow on light, free draining soils, so in many instances pasture improvement may not be appropriate. Increasing ground cover to improve the water balance may be the only option in many instances.

When making changes to native pastures you need to consult the native vegetation act and your pasture advisor for more detailed information.

Lester McCormick

NSW Department of Primary Industries

Wiregrass – *Aristida* spp.

Source: Harry Rose



Source: Harry Rose

Wiregrass (*Aristida ramosa*): Left to right – tussocky habit, seedhead, three awned seed.

Wiregrass (*Aristida* spp.) belongs to a group of native perennial grasses that are recognised by a sharp three awned seed. Purple wiregrass (*Aristida ramosa*) is the most widespread. Wiregrass is a coarse tussocky grass of low forage value and the sharp three-awned seeds are responsible for physical injury to sheep and contaminate wool, skins and meat products. Wiregrass can dominate when native pastures are degraded by over grazing or a combination of fire and the inability to control the resulting additional summer growth, which allows wiregrass to dominate.

Management

Management should target the growth characteristics of wiregrass. Wiregrass can be killed by continuous heavy summer grazing which depletes root reserves. Wiregrass becomes dormant after frosting allowing winter species to grow. Wiregrass seedlings are non-competitive and wiregrass is not hard seeded, so soil seed reserves are quickly lost.

Burning and heavy summer grazing of infested areas over two to three summers can dramatically reduce the dominance of wiregrass. Initially the wiregrass is given a cool burn in late winter or early spring to remove the frosted and dead overburden. As soon as the wiregrass puts on new leaf, it is continuously grazed (ideally with dry sheep and at stocking rates of 15 DSE/ha) to prevent seed set. Grazing continues until the end of

autumn and then the pasture is rested through winter and spring to promote germination, growth and seed production of more productive species. This process may need to be repeated for two to three years, but without the burn.

Pasture improvement will not eradicate wiregrass, but it will reduce its dominance and the plants ability to produce viable seed. Over sowing a legume into native pasture will improve feed quality leading to increased stocking rates and better species will be promoted by the addition of nutrients and a better water balance as a result of increased ground cover.

Pasture replacement with introduced perennial grasses to increase ground cover and productivity is an option where native pastures have become badly degraded. This option will control wiregrass in arable country and can be achieved by cultivation or more preferably direct drilling.

When making changes to native pastures you need to consult the native vegetation act and your pasture advisor for more detailed information on any of the above options.

Lester McCormick

NSW Department of Primary Industries

Management strategy

Grass seed management strategy

Identifying problem weeds and becoming familiar with their growth patterns and potential impacts on livestock underpin an effective management strategy for seed contamination.

The ultimate, long-term goal in grass seed management is to reduce seed set of grass species using strategic grazing, pasture improvement, and to a lesser extent, chemical control.

Lambing earlier, feedlotting and changing target markets help to avoid grass seed contamination rather than tackle the core problem of grass seed set. While these strategies can help in the short-term, they will not fix the seed problem and could even increase the costs of production.

Minimising grass seed contamination of lambs and weaners during their first spring and summer is the main concern for most producers. A successful grass weed management strategy will focus on preparing enough grass seed-safe paddocks for lamb and weaner production.

Management of annual grasses will differ from that of perennial grasses due to their individual seasonal flowering and seeding patterns. But for both annual and perennial grasses, the underlying management principles and profit drivers are the same.

Carefully assess the costs, risks and benefits of the available management strategies and consider their positive and negative implications on the production system and overall business.

The key to managing grass seed contamination is to establish a production system that manages grass seeds while maximising profit per hectare. Grass seeds can be controlled without compromising productivity or reducing product quality.

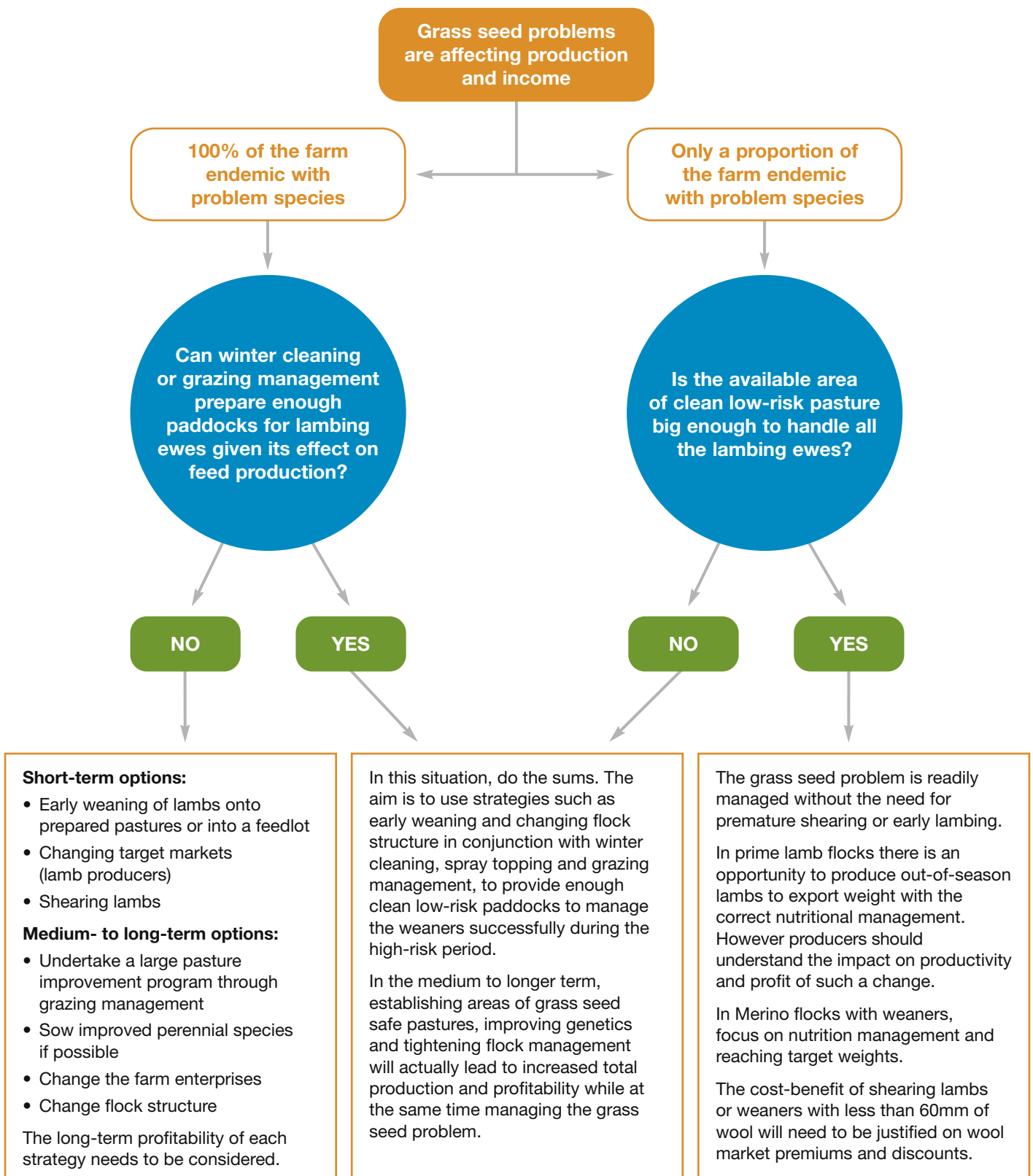
Karl Behrendt
Agrorum Consulting

Four-point plan to manage grass seeds:

- 1 Develop an awareness of the grass seed issue and its impact on the sheep industry.
 - Understand the potential scope of the problem throughout the supply chain from the farm to the end product.
 - Identify problem plant species and their risk period.
- 2 Determine the impact and cost of grass seeds to your business.
 - Monitor stock for seed infestation.
 - Obtain feedback through a trial seed kill.
 - Identify losses in production and profit as a result of grass seeds.
- 3 Develop and implement a grass seed management strategy.
 - Explore all management options available for seed reduction and seed avoidance.
 - Determine the most effective and profitable strategies for your business.
- 4 Obtain feedback, monitor and review your management strategy and make changes where required.
 - Keep accurate records on key indicators so you can measure your performance (success).



Lambs on irrigated pasture.



Livestock and grazing management

Managing problem species by grazing

Use grazing management to manipulate pasture composition and reduce the total number or height of seed heads to minimise their impact on young sheep. Manipulating pasture composition and ground cover in conjunction with improving soil fertility effectively controls and reduces the impact of grasses such as wire grass, spear grass and silver grass.

Heavy grazing, burning or slashing, undertaken either individually or in combination during emergence of seed heads, will reduce seed set. With appropriate rest periods, other more desirable species can then out-compete problem species and improve pasture productivity.

Grazing management to control seeds from annual grasses is most effective where pastures maintain a strong perennial base. Perennials have the greatest capacity to respond after grazing and supply feed to maintain weaners, even after heavy spring grazing has removed problem seed heads.

To achieve this, lock up paddocks for 30 days after heavy late winter and early spring grazing to synchronise seed head development in annual grasses.

After the annual grasses have reached the jointing stage – when nearly all tillers have noded but before they have produced seed heads – graze the paddocks down to 800–1,000kg dry matter/ha with at least 200 dry sheep equivalents/ha over four to five days. This is preferably carried out with cattle, worm-free wethers or dry ewes. Re-stock the paddock with weaner lambs or lactating ewes when pastures reach target levels of 1,500kg of high-quality green dry matter/ha.

During spring, with pasture growth rates of 40–80kg dry matter/ha/day, it will only take two weeks to reach this target, after which it could be stocked with either 20–40 weaners/ha or 11–22 lactating ewes/ha. Rotational grazing is recommended on lucerne pastures.

Heavy grazing during late winter and early spring will also potentially lengthen the vegetative stage of the

grasses and improve their summer nutritive value. The effect on annual grasses is the reduction in the height and size of the seed heads, which leads to a reduction in seed pick-up and their impact on the eyes of young sheep.

This grazing management strategy can be effectively used in extensively grazed lower rainfall areas, where chemical control may be limited to sheep camps and the only pasture improvement option may be lucerne at 20–30 plants/m². However, such grazing management, which tends to increase tillering, is also likely to increase the number of barley grass seed heads and attention to seed management must be strict.

Making silage, which is similar to heavy grazing during the stem elongation phase, can be used to prepare high-quality grass seed-free pastures for weaner sheep. It will be less effective in long-flowering grasses (such as silver grass).

In northern New South Wales and southern Queensland, expanding the area of improved perennial pastures or manipulating wiregrass dominant pastures to more favourable Wallaby grass (*Austrodanthonia* spp.) and Weeping grass (*Microlaena* spp.) dominant pastures will significantly reduce the impact of problem grasses on farm profit and production. This is achieved by strategically burning the pastures in late winter or early spring, before heavily grazing pastures during summer and autumn. This leads to increased vegetative growth of the wiregrass during the summer-autumn period, and with concurrent rotational grazing during the winter it will encourage the dominance of Wallaby grass and Weeping grass.



Heavy grazing pressure at critical times is essential

Flock structure and lambing time

Changing flock structure in a wool enterprise to increase the proportion of wethers can minimise the amount of grass seed-free country required for lambing ewes or weaners. Increasing the proportion of wethers in a flock will increase total wool production and minimise the number of sheep in the most susceptible classes. However, the ideal structure to maximise profit per hectare will depend on bloodline productivity and the comparative ratio of wool to meat prices.

In a prime lamb enterprise, flock structure can only be adjusted marginally by increasing ewe reproduction rates. Higher reproduction rates will mean fewer ewes need to be run to produce the same number of lambs. If this is carried out at the same time as increasing the lambs' genetic potential for growth rate and improving ewe maternal traits, the same amount of lamb (kg) can be produced per hectare with fewer ewes. These improvements can allow lambs to be weaned earlier and run on prepared seed-safe high-quality pastures.

A compact lambing of five to six weeks also reduces the potential scope of the grass seed problem. It enables all operations to be completed (and stock movements minimised) before the high-risk seed dispersal period. For example, completing lamb marking and allowing time for wounds to heal prior to the high-risk period, provides the flexibility to early wean lambs onto seed-safe pastures if necessary.

Lambs weighing as little as 12–15kg can be weaned onto high-quality improved seed-safe pastures but once weaned need to gain weight as quickly as possible until they reach at least 45% of their mature weight.

Large pasture areas are not necessary. Considering that spring pasture growth rates can be more than 40–60kg dry matter/ha/day, these paddocks can stock 30–40 weaners/ha without impacting on growth rates or pasture quality and quantity.

Bringing lambing forward to avoid problems is an expensive way to address grass seed problems. An autumn or early winter lambing always incurs a stocking rate penalty, higher supplementary feeding costs, lower fertility rates in ewes and lower lamb growth rates. Lambing at this time also tends to generate the lowest levels of profitability in prime lamb and wool producing flocks, especially if operating on perennial pastures.

Know when your high risk periods are and avoid mustering or handling during this time. Ensure all lane ways and holding areas are free of grass seeds. This also ties in with the need for a compact lambing period, not only to minimise labour requirements but also to allow early weaning if necessary.

Another way to reduce the amount of grass seed pickup is to provide access to watering points via pathways radiating across paddocks. The pathways can be cleaned chemically or mowed to reduce the amount or height of seed heads. This can help reduce, but not eliminate, grass seed pick-up, as long as sheep are mustered slowly and not disturbed by dogs during the high-risk seed dispersal period. Similarly, moving lambs on cool, damp mornings will reduce pick-up.

Karl Behrendt
Agrorum Consulting



Higher supplementary feeding requirements and costs associated with autumn lambing can make earlier lambing an expensive way to manage grass seeds

The benefits of high performance genetics in grass seed management

High performance genetics are an essential input for every sheep business. The increasing use of Australian Sheep Breeding Values (ASBVs) by seedstock breeders enables commercial breeders to predict the genetic performance of sires more precisely.

Using ASBVs, terminal sire ram breeders are averaging 5% genetic gain each year. Maternal and Merino ram breeders are also improving their rates of genetic gain.

By increasing animal growth rates genetically, livestock can be turned off at a younger age and before grass seeds become a problem. Alternatively, if seed set allows, animals can be grown on to heavier weights at the traditional turn-off time.

Lambs with high growth rate potential also make better feeder lambs and will be of benefit in areas where grass seeds force producers to move lambs into an intensive finishing system or to sell lambs on to a specialised lamb finisher.

Where alternate finishing systems such as lucerne, fodder crops or lotfeeding are available, high growth-rate lambs minimise the time required on the more expensive feed base. Lambs that grow faster also tend to have better feed conversion rates.

While growth rate is the key trait influencing profit when selecting prime lamb sires, it needs to be balanced in relation to fat and muscle. Similarly, a sire's overall genetic package needs to be assessed in relation to the ewe flock.

When considering prime lamb dam selection, consider weaning weight and maternal weaning weight (milk) ASBVs. Ewes with superior ASBVs for these traits will wean lambs heavier at the same age enabling earlier finishing before seeds become a problem.

For more information, visit the Sheep Genetics website at www.sheepgenetics.org.au

Tom Hooke
LAMBPLAN



Shearing lambs and weaners

Shearing before grass seeds become a problem reduces grass seed pick-up and seed penetration of the skin, although it won't completely eliminate seed pick-up. Shearing alone should not be relied upon as the sole strategy to minimising the impact of problematic seed species.

The degree of seed pick-up is partly related to wool length and type. It is also related to the timing of wool removal before the high-risk seed dispersal period, with the barest sheep during this period having the lowest levels of skin penetration from seeds, and subsequently, having the highest weight gains.

It is important to weigh up the cost-benefit of shearing lambs, especially Merinos, against other approaches that avoid the need for premature shearing.

Shearing prime lambs purely for market preference is questionable as premiums or discounts often do not absorb the extra cost of shearing.

Many trials have shown that, when grass seeds are not an issue, shearing does not increase growth rates of young sheep when compared with leaving them woolly. In practice, shearing itself may well depress weight gains in the short term, especially if followed by inclement weather.

When considering the cost-benefit of premature shearing of lambs, take into account:

- the potential skin value gained for shorn lambs when they are sold
- the costs of shearing
- wool income
- the risks associated with not shearing such as seed contamination, flystrike and belly dags in a feedlot situation.

Karl Behrendt
Agroforum Consulting



The feeder lamb option

Producing feeder lambs offers a potential solution for properties that cannot avoid seed contamination of finished lambs. Under this system, a smaller lamb is turned off and the late lactation needs of the ewe are better matched to the length of the spring.

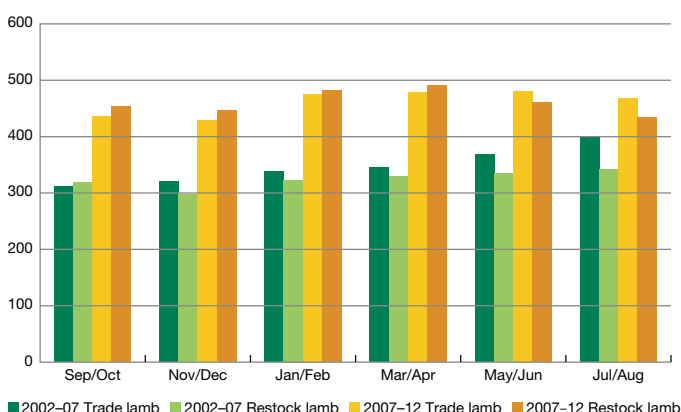
Before changing to a feeder lamb system it is important to do some market analysis and production planning to determine if the change will be more profitable.

Market analysis

Compare the average price received for the lambs you have been producing against your expected prices under the feeder lamb system.

For example, using the average of all states in the last five years (to 2012), restocker lambs have traded at a premium to finished lamb prices from September through to April, but in the five years previous to that they traded at a discount (see graph 1). South Australian restocker lamb prices have traded at a premium to Victorian and NSW restocker lamb prices.

Graph 1: Comparison of prices (¢/kg DW) by month for trade lamb (20–20kg, FS3) and restocker lamb (0–18kg) for 2002–2007 and 2007–2012



This is potentially a structural shift in the industry with a move to more segregation of breeding and finishing and a realisation by pasture based finishers that the cost of production can be quite low. It is also potentially a reflection of the fact that a substantial portion of the five years 2007–2012, was a rising market which created a lot of confidence in the lamb finishing business.

On that basis it would be prudent to assess the benefits of the feeder lamb option without budgeting for a price

premium. It may also be prudent to test the potential price discount that could be taken if the prices decline and confidence is lost.

To make a switch to feeder lamb production a guaranteed success you will need to have a production system that is more productive than the system in which the lambing date is earlier and lambs are to be finished before they are sold.

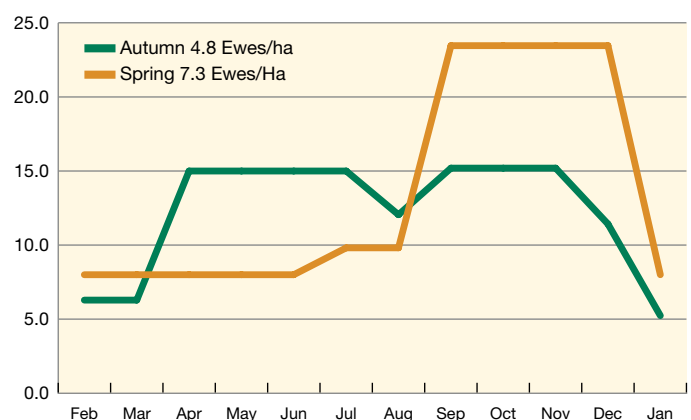
Production planning

Feeder production enables a later lambing which, in turn, means you do not have to support pregnant and lactating ewes during autumn to early winter, usually the period of least pasture availability. While this will enable you to run more ewes, it will also require more attention to the flock's nutritional needs during late summer and autumn, leading up to joining.

Some consideration will need to be given to just how many additional ewes can be run through this period. The lower the rainfall environment, the riskier it is to run a higher number of sheep over this period.

Graph 2 shows the variation in DSE per hectare between an autumn lambing system and a spring lambing system selling feeder lambs.

Graph 2: Variation in Dry Sheep Equivalent (DSE/ha) between autumn and spring lambing systems



Spring lambing allows more ewes to be run but the extent of the increase is likely to be determined by the summer autumn stocking pressure.

Having identified how many additional ewes can be run, it is also important to determine how you will fund the purchase of additional ewes or, alternatively, how you will use the additional area that is created if the ewe flock is kept at the same size.

Other production parameters that are likely to change from an autumn system to a spring system would be the number of lambs weaned per ewe joined and the growth rates to sale. Higher outcomes would be expected for both in the spring lambing system as the joining period is better matched to the seasonality of oestrus and there will be more feed available during lactation.

A gross margin comparison

Changing production systems alters the key performance benchmarks of the livestock enterprise. To illustrate this, Table 1 provides an example of a gross margin analysis where all things are held equal other than the time of joining, the July stocking rate, the live weight at sale and the price received for lambs.

No discount for feeder lambs is budgeted for because, on average over the past ten years, there has been no discount for feeder lambs against 18–20kg carcass weight lambs (graph 1).

The gross margin per ewe falls from \$77 to \$54 because there is less sheep meat produced per ewe and it is of a lower value (\$3.94 versus \$3.71). However, the gross margin per hectare is slightly improved because more ewes are being run per hectare. Running more ewes also increases the marginal cost of production per kilogram of sheep meat as the maintenance cost of the ewe is high and there are fewer kilograms of sheep meat per ewe.

The average price received per kilogram of sheepmeat falls in the spring lambing system because there are more ewes in the system and therefore a higher percentage of lower-value mutton as a proportion of total sales.

Gross margins per hectare are slightly improved because the amount of sheepmeat produced per hectare rises from 134kg to 170kg, but if your production lapses then your profits will be under substantial pressure.



A 'feeder lamb' is a lamb specifically bred from rams and ewes of known desirable meat characteristics such as growth, muscle and leanness; the lambs are grown fast on available green feed, weaned at 12–18 weeks and moved/on-sold to a specialised finishing system or background operation in preparation for finishing

The potential to lift profitability further will depend primarily on the increase in ewes per hectare from the spring lambing system at the same or perhaps a better price than for the current production system.

Gross margin analysis of sucker and feeder lamb systems

	Sucker	Feeder
Time of lambing	Autumn	Spring
July stocking rate (DSE/Ha)	15	9.8
Weaning %	110%	125%
Replacement ewe cost	\$130	\$130
5-year av. \$/kg of lamb	\$4.30	\$4.30
Feeder lamb discount		0%
Discount for tail	30%	30%
Gross margin per ewe	\$77	\$54
Gross margin per ha	\$366	\$390
Price received per kg	\$3.94	\$3.71
Kg sheepmeat per ha	134	170
Marginal cost per kg	\$1.62	\$1.75

Sandy McEachern
Holmes, Sackett and Associates

Feedlotting

The risk of grass seed infestation of sheep and lamb carcasses, skin and wool is often a transitory event, for which short-term containment in a feedlot or small paddock can be a viable management option.

The most important aspect in regards to using feedlots as a management tool is to ensure lambs are free of grass seeds prior to entering the feedlot. Grass seed management must be addressed before this stage, including seeking assurances of seed status when purchasing lambs.

While an elaborate establishment is not required, the area needs to be clean, adequately sloped and well drained. Shade and shelter are also required to minimise the risk of cold or heat stress. Adequate separation distance should be maintained between the feedlot and any sensitive receptors such as houses, waterways or public areas.

It is important to determine the nutritional requirements of different classes of sheep during the containment period. Dry ewes, rams and wethers will maintain condition on lower quality feeds while weaner lambs and replacement ewe lambs have higher nutritional requirements for maintenance and growth. Ideally, seek professional advice about the most cost-effective ration to feed until paddock feed once again becomes an option.

National guidelines for the design and management of lamb feedlots and containment areas are now available at www.mla.com.au/lambfeedingguidelines

Key management factors include:

- Slowly introducing lambs to grain before placing them in the feedlot to prevent grain poisoning (acidosis)
- A suitable vaccination program before entering the feedlot
- If the diet is cereal-based, providing calcium and salt in the form of a loose lick
- Providing a constant supply of fresh water and cleaning troughs regularly to maximise water intake

San Jolly, Hamish Dickson
Productive Nutrition P/L



Source: Productive Nutrition Pty Ltd

A feedlot can be a viable option to carry lambs through the grass seed risk period until clean paddock feed becomes available.

Agronomic management

Spray grazing pastures

Spray grazing reduces broadleaf weeds, including *Erodium*, enabling more productive pasture species to dominate. It can be done in conjunction with a red legged earth mite and lucerne flea control program. Pastures can become grass dominant so careful attention to seed management of the riskier grasses is important.

Spray grazing uses sub-lethal rates of selective herbicide to increase the palatability of broadleaf weeds. After a one-week withholding period, sheep are placed in the sprayed paddock at high stocking rates to graze out the broadleaf weeds over the following two weeks. The higher the stocking rate, the lower the rate of herbicide required. After two weeks, the palatability of broadleaf weeds declines.

While spray grazing can be relatively inexpensive, the use of sub-lethal herbicides requires an effective strategy to be successful. For example, if growing conditions are not suitable for chemical uptake, the impact of spray grazing can be less effective. Developing an understanding of medic and/or subterranean clover and weed growth stages will aid the success of spray grazing. Subterranean clover is more tolerant to hormone-based herbicides than medics.

Having a good plant nutrition program in place can enhance the effects of spray grazing, as the desired pasture species are able to grow away from the chemically suppressed and heavily grazed weeds and out-compete undesirable grass weeds.

Winter cleaning

In lucerne and annual pastures the winter cleaning approach, conducted when soil moisture conditions are good, can result in virtually grass-free paddocks, and the control of many broadleaf weeds. In addition to providing grass seed-free areas for lambs, winter cleaning also has the added benefit of increased pasture growth. The removal of grasses from the pasture results in the pasture becoming legume dominant. This can lead to potential stock losses due to redgut if fibre is not provided in the diet. Contact a veterinarian for local recommendations.

Annual pastures

Winter cleaning of annual pastures can be done relatively early in the season. For removal of grasses (except silver grass) from a medic pasture, various grass herbicides can be used. Broadleaf weeds can also be targeted relatively early, conserving moisture and nutrition for more desired pasture plants. Contact your local agronomist to determine specific herbicide and management options.

Lucerne

Mature lucerne stands can be cleaned of grass and broadleaf weeds using high rates of products like Sprayseed®, Simazine® and Diuron®. Raptor® can be used when it is not desirable to temporarily burn lucerne stands for weed control. This chemical is very soft on lucerne and when applied early, controls silver grass and a number of other grasses effectively. It does this whilst not taking out veldt grass – so the end result is a lucerne/veldt pasture.



Visual effect of winter cleaning on paddocks in central west NSW, October 2009. Left: Paddock winter cleaned with an estimated <5% Barley Grass content during spring. Right: Untreated paddock with an estimated 30% Barley Grass content.

Spray topping pastures

Spray topping involves spraying pastures during spring with low levels of knockdown herbicide to prevent viable seed set. Ideal conditions and timing are critical to the success of this technique. Although cheap, success is often low and too much seed ‘escapes’, therefore this approach is increasingly not the answer for managing grass seeds.

Spray topping works best when pastures have an even seed head emergence, but this is often not easily achieved over large areas or with low stock numbers. Heavy grazing before spray topping will encourage synchronised flowering of weeds after which low rates of either Glyphosate® or Paraquat® can be used to thwart seed set.

In paddocks where seed head emergence is not uniform, higher herbicide rates will be required which will effectively hay-freeze the pasture.

Spray topping is most effective on weeds with a short flowering period as this increases the likelihood of the weeds flowering at the same time. Where a mixed sward is present, it is best to target the most damaging weed species and time the chemical application to coincide with seed head emergence. Attempting to control multiple weed species with a single application will compromise the control of all species.



Spray topping

Some producers spray early with a lower chemical rate to pick up earlier maturing grasses and then re-spray 3–4 weeks later to target other weeds. Provided soil moisture is adequate, this will also extend the life of the pasture.

Fodder conservation

Fodder conservation can assist in seed control by removing grass seed heads from a paddock and creating a grass seed-free environment for grazing stock.



Hay making

When conserving fodder such as hay or silage, plan early, apply adequate fertiliser, use timely insect and unwanted weed control. After harvest, follow-up with glyphosate or heavy grazing to stop regrowth from developing seed heads.

Conserving fodder provides a source of quality feed that can be used to finish lambs in a seed-free environment such as a feedlot.

Pasture improvement

Pasture improvement uses management practices to promote healthy soils and plants. It is important that pastures receive the best possible start and are maintained to ensure they can out-compete undesirable species in the stand.

When done properly, pasture improvement assists in grass seed management, and delivers the added benefits of being able to carry more stock that are healthier, grow faster and are more fertile. In addition, pasture improvement offers fodder conservation opportunities and the ability to set up paddocks to regenerate year after year.



Prior to sowing a new pasture it is important to identify why the old pasture has run down, and ensure these problems are rectified

Before embarking on pasture improvement, ensure the correct grazing management can be applied to maintain persistence and competitiveness of the sown pasture plants.

Critical steps in sowing a new pasture include:

- Determining why the old pasture has run down (grazing strategy, nutrition, seasonal) and ensuring these problems are rectified
- Preparing the new pasture the year before by reducing seed set of unwanted species
- Undertaking soil tests to determine nutritional needs
- Allowing run-down pasture and weeds to germinate and spraying with knockdown herbicide and insecticide
- Inoculating legume seed and sowing into a moist seedbed with adequate fertiliser
- Monitoring emergence, insects and slugs
- Considering broadleaf weed control
- Grazing to promote tillering, seed set in the first season and long-term persistence

Harrows

Grass seeds can be knocked to the ground by dragging harrows or implements such as old tyres across a grassy pasture late on a hot day. While this reduces the seed contamination risk, there is still potential for some seed pick-up because the grass seeds have not been removed from the system. To reduce seed pick-up, use shorn sheep to graze these paddocks.

This practice is best used as an interim approach while long-term strategies are put in place or where adequately clean areas can not be achieved through other means.

Sale-stock grazing harrowed pastures need to be monitored carefully for seed pick-up and removed from the paddock immediately if seed contamination becomes evident.

Machinery and equipment used for harrowing needs to be inspected for weed seeds thoroughly and cleaned before removing it from infested paddocks. This is especially necessary for paddocks containing Chilean needle grass (*Nassella neesiana*) as it is readily spread by attachment to machinery.



Clay spreading

Clay spreading

The spreading and incorporating of clay on low fertility sandy soils lifts the germination and competitive ability of desirable pasture species, enabling them to out-compete problem plants, particularly silver grass.

Selective application of clay on a variable paddock will also allow the whole paddock to be treated the same for grazing management, cropping programs and chemical application.

Ensure that a supply of good quality clay is close to the area to be spread. Poor quality clay with high calcium carbonate levels will attract and support snail populations.

Rates of application will vary between 70 and 250 t/ha and need to be tailored to the annual rainfall for the area. Too much clay can cause moisture stress.

Clay should be spread when it is dry and well incorporated to a depth of 15–30cm. Cross working can be beneficial.

Subsequent to clay spreading, it is important to monitor nutrient levels using soil and tissue tests as pH issues can arise along with manganese deficiency.

If clay is only 30–45 cm below the surface, delving should be considered as an option.

Michael Camac

Coorong Ag Services, Meningie

Sown fodder crops

Fodder crops enable lambs to be removed from pasture with potential grass seed problems into clean paddocks.

Fodder crops are usually sown between winter and early spring. Staggered sowings enable lambs to be fed on one area for a set period and then moved into a fresh paddock.

A late-season option in dryland areas may be grazing mature grain crops rather than green herbage but be wary of associated health risks.

Along with animal production benefits, fodder crops improve the nitrogen and organic matter content of the soil and certain crops can assist in root disease control.

There are many fodder crop options, enabling a choice that is best suited to the environment and production system. Fodder crops include:

- **Oats or a combination of oats and vetch.** Using herbicides to manage grass weeds in this mix can be difficult, other than hay freezing at the optimum time. If involved in cropping, this fodder crop is best sown into a clean paddock from the previous season where Simazine® and Verdict® have been used to reduce silver grass and geranium (*Erodium* spp.).
- **Barley and vetch.** Chemical control of grass weeds is easier with this mix but take care with barley during grain fill. Hay freezing is also an option for weed control.
- **Pulses** such as peas, beans and vetch allow easy control of grass weeds but some broadleaf weeds can be an issue, making it best to sow pulse crops later in the season. While this can reduce herbage quality, if the crop is allowed to mature before grazing, animals will benefit from the high protein content of the seed.

Ensure the associated health risks are managed with fodder crops containing grain and that grass seed set is controlled in all non-arable areas, such as fence lines and gullies.

Fodder crops allow higher stocking rates of at least 10–20 lambs/ha (15–40 DSE/ha), depending on whether maintenance or growth is required.

Stock health issues when grazing fodder crops must be considered and management options such as deferred grazing, supplementation and increased dietary roughage should be considered. It is best to seek advice to avoid some of the potential pitfalls in growing and feeding them.

Michael Camac
Coorong Ag Services, Meningie



An oat and vetch crop can be utilised as a confinement crop for direct grazing or for hay production

Irrigation

Moving lambs from grass seed areas, before seed set, to an irrigated pasture system is another option to minimise the risk of grass seed contamination.

However, to ensure this is a profitable alternative, do a budget before establishing an irrigation system. Requirements for irrigation depend on pasture type, climate and soils and it will be important to determine the optimal irrigation schedule for each region and production system.

Irrigating perennial pastures extends the time green feed is on offer. Carry out a soil test to determine nutrient requirements and apply phosphorous and nitrogen to



Irrigated lucerne

increase pasture production. Perennial pastures respond best to rotational grazing.

Only irrigate pastures with good plant composition. Irrigating poor pastures is highly inefficient.

Apply adequate stocking rates to maximise pasture production and maintain perennial pastures in their productive vegetative phase through late spring to early summer. It is important to know the pasture growth curve.

A well balanced pasture with little weed infestation can be stocked at 16–25 DSE/ha throughout late spring and early summer, and will provide enough feed to finish two to three lots of feeder lambs to trade specifications.

Lucerne

With effective management, dryland lucerne will restrict seed production from annual grasses and broadleaf weeds. A dense (at least 20 plants/m²) winter-cleaned stand of lucerne will provide a clean grass seed free pasture for lambs.

Before lucerne establishment

Spray topping the pasture or pulse crop in spring before lucerne establishment will provide lucerne with a competitive edge by reducing weed seeds. Cultivation and knockdown in combination with pre-emergent and in-crop herbicides will also help the establishment process.

On sandy soils, spreading and incorporating clay will aid lucerne germination and growth and increase its ability to out-compete weeds.

Seedling lucerne

Seedling lucerne is not a great competitor and delaying seeding to get a good kill is a smart move with grassy weeds, especially silver grass.

Traditional knockdown sprays can be used during seedling establishment but take care to check plant back periods. Seek advice on pre- and post-emergent herbicides to use with first-year lucerne. Silver grass is difficult to control at this stage.



Established lucerne

Herbicide options increase for silver grass and other annual weeds in established lucerne. Winter cleaning and spray topping can also be used during this phase.

Companion pasture and fodder species can be sown into lucerne to compete with grassy weeds and provide a balanced ration throughout the year. While some species can be sown with lucerne, most are best drilled into the stand in the year following establishment. Prepare the seedbed by grazing the lucerne after the break and apply Sprayseed® or a Paraquat® spray for early weed control.

Seek advice on the most appropriate species for your rainfall and situation. Use perennial species only in high rainfall areas (>500mm) and use annuals in the lower rainfall areas. Perennial species include chicory and the perennial grasses. Annual species include cereals, annual rye grass, annual medics and the annual clovers.

Effective grazing management is vital for both profitable lucerne production and weed control. New stands are particularly vulnerable to grazing over the first summer.

Grazing the young lucerne plant should only occur when the smallest plants are difficult to pull out by hand. The first grazing should be a very light grazing – ideally with a high stocking rate for a short amount of time with stock removed before crowns are grazed. Plants that are beginning to wilt and drop older leaves can benefit from being lightly grazed.

Rotational grazing will provide a long-lasting lucerne stand. Ideally, lucerne should be grazed for 3-7 days when a flush of secondary growth (2-5cms) appears from the crown. The appearance of this growth indicates the plant has replenished crown reserves and will have produced a crop of good quality primary stems and leaves for grazing or cutting.



Lucerne

Stocking rate, stock type and class, rotational period, seasonal conditions and weed growth all interact to influence grazing management. Large numbers of smaller paddocks result in better lucerne growth and better animal performance and make it easier to control weedy grasses and broadleaf weeds.

Established lucerne can be persistent on longer grazing rotations (ie 35 days grazing) providing the plant is given a similar or longer time to recover. The length of the grazing rotation should be managed so that both the lucerne and companion species are well utilised before allowing the stand to recover. This will assist the competitiveness of lucerne and help to reduce seed set of undesirable grasses.

Alan Humphries

South Australian Research & Development Institute

Lamb assessment

Assessing sheep or lambs for seed contamination

While it is difficult to predict whether grass seeds have penetrated the skins and carcasses of live animals, a reasonable indication can be achieved by assessing grass seed levels in the wool.

Wool on lambs or sheep

Closely inspect the animal on the brisket, neck, shoulders, belly, legs and lower ribs as these are the most likely areas to retain seeds. The back should also be inspected if lambs come from areas prevalent with wire grass, spear grass or Chilean needle grass.

While some grass seeds will fall out of the wool over time, many will move through the wool to penetrate the skin and carcase.

Shorn lambs or sheep

Shorn lambs or sheep can appear clean, even when grass seeds have penetrated the skin or muscle before shearing. Shorn animals should therefore be considered in relation to their grazing history. If the sheep have been on pastures containing problem weed species that have set seed during the grazing period, the animals are likely to have some seed penetration.

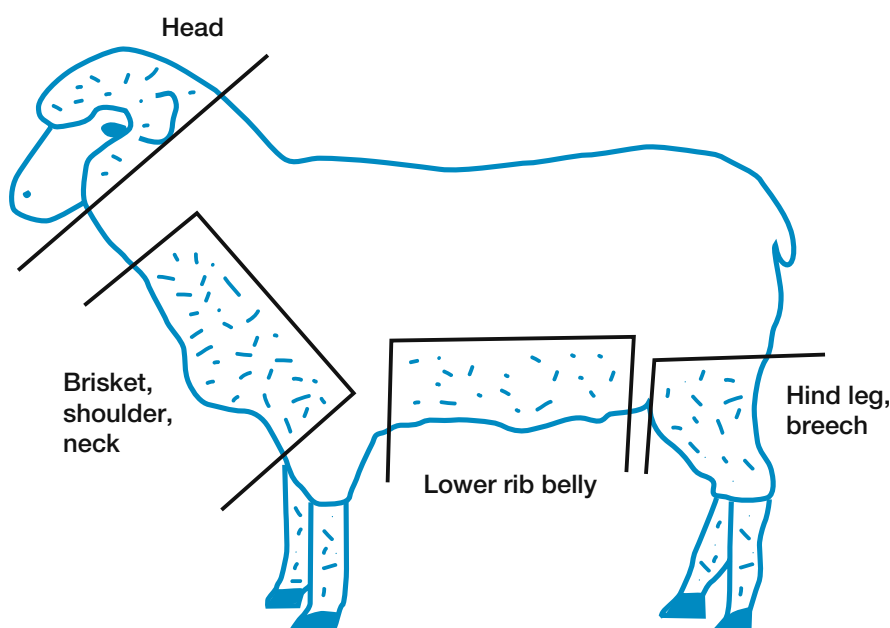
Industry standards to describe the level of seed contamination of the fleece have been developed. Using these standards, the quantity of contaminated seed observed can be described as:

- None observed
- Light (very few seeds on belly, lower points and brisket)
- Medium (moderate numbers of seeds on belly, brisket and flanks)
- Heavy (obvious large number of seeds over most of the body)

When describing levels of seed contamination, identifying the type of seed present can also be useful.

These assessment standards provide a useful guide when purchasing stock from an unknown seed background and for unforeseen scenarios such as stock escaping from a clean paddock.

Chris Shands
NSW Department of Primary Industries



Identification points for assessing the level of seed contamination of lambs

Lamb marketing

The role of the stock agent

The stock agent's role in grass seed management is to:

- Ensure the product supplied to processors and finishers is free of seed and able to meet specifications
- Create an awareness of the problem in their area and educate their vendors in management procedures
- Keep a database of those clients who have supplied seeded lambs to assist in future marketing
- Speak to abattoirs about the problem and discuss how big the issue is for them
- Encourage producers to use trial seed kills
- Involve local livestock consultants in regional producer meetings or workshops (explore the interest of a spray company to partner and co-sponsor)
- Gather as much background information as possible when buying lambs off-farm and make an assessment of their seed risk as well as determining the animals' general health and genetics – ultimately, put strategies in place to develop a long-term breeder-feeder alliance

AVOID BUYING FEEDER LAMBS FROM SALEYARDS

- Do not knowingly market lambs with seeds – declare the lambs as seeded and accept the penalty (this is an industry problem). Only by accepting the penalty will vendors learn to accept responsibility for management.

GRASS SEEDS ARE COSTLY TO OUR INDUSTRY – DO YOUR BIT TO MINIMISE THEIR IMPACT

*Noel Evans, Cox Rural
Keith, SA*

Marketing tips:

- Adopt marketing options as part of a full 'on-farm' management practice
- Inform buyers of your grass seed status
- Place a greater emphasis on time of marketing
- Sell over-the-hooks to receive feedback on meat and skins
- Sell lambs to lamb finishers – maximise production per hectare through stocking rate, weaning percentage and lamb growth rate
- Sell lambs before seeds become a problem – this could mean targeting a new market or developing a new production system
- Consider intensive finishing – free of seed to market specifications
- Agist lambs in areas where pastures mature later
- Supplementary feed to hit target weights earlier
- Use improved genetics to turn lambs off at target weights earlier



Lambs in a feedlot.

Winning against seeds at the saleyard

Sale yards and livestock exchanges can play a major role in ensuring they are not used as a 'dumping ground' for secondary stock and seed-infested lambs.

Many sale yards have invested in 'flexible capacity' to manage the large numbers of prime lambs requiring marketing before grass seed infestation becomes a problem on-farm.

Many processors offer trial kills to test for grass seeds, and lambs that are rejected could eventually find their way into a sale yard somewhere. This is unfortunate, as some buyers have been caught out unknowingly purchasing seedy lambs they have previously rejected.

To minimise the risk of buying seedy lambs, buyers need to study vendor declarations and use caution when buying lambs from certain areas. Verbal placarding, involving the verbal disclosure of vendor location and trial seed kill status, operates in some sale yards. Producers who continue to try and beat the system will eventually be caught out and buyers will refuse to buy their stock.

When buyers are forced to refrain from buying from a whole region, producers who are managing their seed risk are unduly penalised. Their only recourse is to confirm seed status of their stock, perhaps by a trail seed kill, and make a point of difference at time of sale.

The National Livestock Identification System for sheep has enhanced traceability to property of origin. This will be of great benefit to all purchasers of both prime and store lambs.

Whether lambs are sold through the sale yards or over-the-hooks, penalties are being incurred for seedy lambs.

To obtain optimum prices for lamb, producers need to take ownership of the problem and engage in better farm management practices to minimise the risk of seed infestation and produce a product free of grass seeds.

Just as producers follow simple presentation guidelines to attract the best possible price, such as minimum time off feed, bung-hole crutch and only applying raddle or spray to the head, it is equally important to minimise grass seed contamination of the skin and meat.

Richard James

Livestock Saleyards Association of South Australia



Pen of grass seed-free lambs

Trial seed kills

Many processors offer a service of trial seed kills where a portion of a consignment or mob is randomly selected and sent for processing. These animals are monitored closely through the slaughter process and assessed for grass seed contamination. Feedback is then provided to the producer about the grass seed status of their stock.

The basic steps involved in a trial seed kill include:

- Contacting the processor to organise a trial kill (this can be done personally or through an agent)
- Randomly selecting up to 10% of lambs from the mob by running the lambs through a race and drafting off every tenth animal – check with your processor on specific numbers
- Organising transportation to the processor
- Receiving feedback – generally within 24 hours

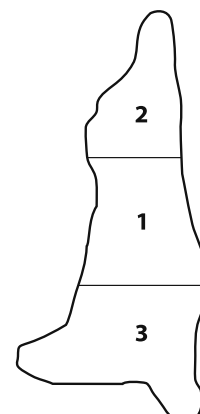
Feedback on grass seeds

A grass seed report similar to that shown below should be received for each trial kill. This indicates the amount and location of seeds in the carcase and the proportion of affected lambs and will explain the tolerance or rejection of trial seed-kill lots.

Most processors will provide a similar feedback report to producers whenever a grass seed penalty is given on a consignment of lambs. Such a report will often be accompanied by photographs of the seedy carcasses.

Widespread use of such grass seed reports within industry will assist producers to identify the extent of their grass seed problem so that management strategies can be put in place to prevent contamination of future consignments.

1 = Loin area
2 = Hindquarter
3 = Forequarter



GRASS SEED REPORT

LOT No: **120**

VENDOR: **Smith & Sons**

PIC: **NK991234**

KILL DATE: **23/7/12**

NO. KILLED: **31**

Level of grass seed infestation in carcase

Carcase location	NIL	LIGHT	MEDIUM	HEAVY
Loin	✓			
Hindquarter	✓			
Forequarter			✓	

Was seed infected? Yes / **No**

Comments: **20% of carcasses required medium trimming**

Appendix

Further reading

Spurling, F. PIRSA Grass seeds fact sheet

http://www.pir.sa.gov.au/__data/assets/word_doc/0006/167415/Grass_Seeds_April.doc

GRDC Weeds: The Ute Guide App

<http://www.grdc.com.au/Resources/App-Store>

NSW DPI Fact sheet – Purple wiregrass

<http://www.dpi.nsw.gov.au/agriculture/pastures/pastures-and-rangelands/native-pastures/native-grasses---slopes/purple-wiregrass>

NSW DPI Fact sheet – Rough speargrass or corkscrew grass

<http://www.dpi.nsw.gov.au/agriculture/pastures/pastures-and-rangelands/native-pastures/native-grasses---tablelands/rough-speargrass-or-corkscrew-grass>

National Procedures and Guidelines for Intensive Sheep and Lamb Feeding Systems

Edition 2 (June 2011) Meat and Livestock Australia.

www.mla.com.au/lambfeedingguidelines

PIRD Final Report.

Managing Grass Seeds in Weaner Sheep

Project Code: B.PRS.0703 Central West Sheep

Producers, 2010.

<http://www.mla.com.au/Research-and-development>

Moore, J., Sutherland, S. & Verbeek

Barley Grass

http://www.agric.wa.gov.au/objtwr/imported_assets/content/pw/weed/major/barleyg.pdf

Borger, C., Hashem, A. and Douglas, A. (2012)

Silver grass in the WA wheat belt

WA Dept. of Agriculture & Food Farmnote 545.

http://www.agric.wa.gov.au/objtwr/imported_assets/content/past/aps/farmnote-note%20545%20silver%20grass%20in%20the%20wa%20wheatbelt.pdf

Chilean needle grass national best practice management manual

<http://www.weeds.org.au/WoNS/Chileanneedlegrass/>

Training

Making More From Sheep

www.makingmorefromsheep.com.au





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