



Organic Farming: Prime Lamb Finishing Systems

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This Agnote provides information on finishing and marketing lambs within an organic farming system. This Agnote should be read in conjunction with AG 1237 Organic Farming: Prime Lamb Production, AG 1268 Organic Farming: Internal Parasites in Sheep and AG 0437 Organic Farming: The Certification Process.

Introduction

Victoria is a leading producer of lamb meat in Australia, producing 38.4% of total production (MLA 2005). This production is based on favourable climatic conditions that support resilient pasture systems, selection to achieve lambs that provide high lean meat yields, and producers with knowledge, skills and management expertise. In the year ended June 2007, over 4 million lambs were produced in Victoria (ABS 2007)¹.

Victoria has approximately 350 certified organic primary producers but there are only about 30 who specialize in lamb production. This number is expected to increase as demand for organic lamb increases.

As organic lamb is an emerging niche industry, it is important for producers to understand the requirements of organic certification, but also the requirements of an emerging market. This Agnote provides information on achieving lamb supply through the year, appropriate animal health, marketing and potential economic returns from organic production. The economic information is based on two years data collected as part of the Naturally Victorian Initiative and should only be used as a general guide.

What is organic lamb?

Organic lamb refers to a young sheep normally sold from 6 to 12 months of age that are gestated, born and raised on an organically certified property.

What is a finishing system?

A finishing system is the means by which a lamb is grown from weaning to market weight. In Victoria, it involves the use of pastures, both annual and perennial, often including lucerne, but may also involve grain supplementation.

¹www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/7111.0

Achieving lamb supply through the year

The organic market is a niche market and is therefore subject to volatility in terms of supply and demand. In some years there will be excessive supply resulting in reduced prices and organic produce being sold into the conventional market. In other years there will be high demand and higher prices but insufficient supply. Lamb producers who can provide lambs at different times of the year can partly even out these supply anomalies and reduce the risk of lower prices due to over supply.

In Victoria, the majority of lambs are finished from September through to December. These lambs are typically finished on pasture systems consisting of subterranean clover and annual or perennial ryegrass. Producers can extend this finishing period if they invest in alternate perennial forage systems such as lucerne, chicory or native grass species that are active over summer. Having an extended growing season allows lambs to be sold from October through to March thereby assisting in lamb supply and achieving the best possible prices.

Annual pasture finishing systems

Annual pasture finishing systems are those that are based primarily on subterranean clover and annual ryegrass pastures. This pasture mix can provide a highly nutritious feed for weaned lambs for the period August through to November. The clover and ryegrass germinate after autumn rainfall and reach their peak production, in average rainfall years, during September and October, after which flowering and seed production occurs and feed quality declines. By the end of December, or earlier in dry years, these pastures cease active growth until the following break rainfall when they germinate from seed.

a. Seed production

Subterranean clover has to be allowed to set seed each year so that there is an ongoing supply of seed in the soil. Selection of a subterranean clover cultivar will depend on seasonal conditions, especially spring rainfall to allow flowering and seed set. Sub clover also has a percentage of hard seed which is an important feature to withstand false germinations due to summer rainfall or false autumn breaks. The maturity and level of hard seededness should be carefully considered when choosing a cultivar.



Figure 1. Organic lambs being finished on annual ryegrass and subterranean clover pasture, rotationally grazed, in north east Victoria.

a. Set stocking versus rotational grazing

In annual pastures, set stocking has the effect of promoting the legume component of the pasture, as the taller grass species are grazed more readily. This can result in a less diverse pasture and potential invasion from broad leaf weed species. Rotational grazing, which allows a period of recovery after grazing, results in better pasture growth through management of re-growth and pasture residues. This can result in better animal intake and production. In spring when pasture growth is at its peak, higher stocking rates can be used to achieve better pasture utilization and less wastage.

c. Pasture growth through the season

Annual pasture growth changes through the season and from year to year so it is important to understand when the peak production occurs and the potential for significant pasture composition change. For example, peak production at the Rutherglen organic site occurs in spring and when under grazed, annual ryegrass begins to dominate the sward.

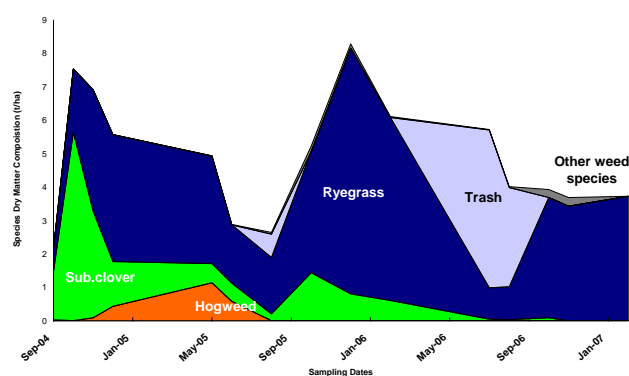


Figure 2. Pasture growth (t/ha) showing spring production peaks and change in composition from September 2004 until January 2007 at the certified organic site, Rutherglen.

Perennial pasture finishing systems

Perennial pasture finishing systems typically include the use of species such as lucerne, chicory, phalaris, perennial ryegrass, or even native grasses that are summer active. Unlike annual pastures, production can occur over a longer period of time and some species can be responsive to

summer rainfall. Lucerne and chicory are generally grown as monocultures in conventional systems but a pasture mix containing several perennial species can also be established. Diverse pasture mixes can prevent weed species invasion and provide a feed of higher nutritive value for lambs.

a. Pasture persistence

Rotational grazing to allow sufficient rest periods is critical for the long term management of a perennial pasture. Lucerne grazing management is critical for persistence and involves short grazing periods where the height and growth stage of the plant is closely monitored, followed by recovery periods to allow re-growth. Lucerne grazing management in an organic system can be accessed via the Agnote AG 1278 Organic Farming: Perennial Pasture Management.

Chicory is a perennial forage herb with good drought and pest resistance once established. Like lucerne, it must also be rotationally grazed and with appropriate management, may persist for 3-4 years. It has relatively low levels of fibre which enables lambs to digest it easily and trials conducted at Rutherglen showed that lambs gained more weight faster on chicory in comparison to a feedlot situation or a lucerne/pasture combination under conventional management. Chicory has a requirement for nitrogen and in a mixed perennial sward established in 2004 on the Rutherglen organic site, did not compete well with lucerne, plantain and phalaris.

b. Pasture growth through the season

Perennial pastures have some growth activity throughout the year and this is especially important in summer when annual pastures are not growing (Figure 3).

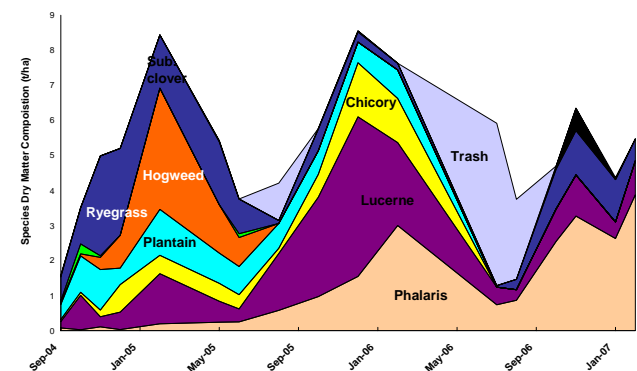


Figure 3. Pasture growth (t/ha) showing summer production peaks and change in composition from September 2004 until January 2007 at the certified organic site, Rutherglen.

Close attention to rotational grazing management is required to avoid the accumulation of dead material and reduced productivity from the perennial component.

Native grasses such as Kangaroo Grass (*Themeda triandra*) and Red Grass (*Bothriochloa macra*) can be used to provide additional feed.

Both species are warm season grasses, having their main growing period through the summer months, and are drought and frost tolerant.

Kangaroo Grass has moderate to high nutritive value with crude protein of 5% in the winter but 17% in the summer. Red Grass has lower forage crude protein content (4-15%) but the green leaves are readily consumed by sheep during summer.



Figure 4. Lambs grazing a perennial pasture of chicory, plantain, lucerne and phalaris at Rutherglen.

c. Perennial Ryegrass Toxicosis

Perennial ryegrass toxicosis (PRGT) can be a serious problem in sheep grazing perennial ryegrass dominant pastures during summer and autumn months, in the winter rainfall areas of South East Australia.

A large percentage of established perennial ryegrass plants are infected with an 'endophyte' fungus known as *Neotyphodium lolii* which produces chemicals that cause toxic effects on livestock. High risk seasons are likely where late season rainfall causes abundant pasture growth and where the following summer and autumn conditions include hot spells during a dry period.

The most commonly recognised symptom of PRGT is 'ryegrass staggers', which may occur within a few days of exposure to infected pastures (or hay or silage). Mildly affected stock develop tremors which are exacerbated by external stimuli. As the toxicosis worsens, animals lose coordination, develop a stiff gait and vaulted back and lose control of their direction of movement. They may collapse, have convulsions, and be unable to rise, leaving them susceptible to dehydration, starvation, attack by predators.

Less obvious signs may include ill-thrift, especially in weaners, heat stress, and scouring, which all contribute to production losses and animal welfare concerns even when staggers are not seen. Drowning can occur when heat stressed sheep seek water to cool off.

There is no specific therapy for PRGT. Recovery occurs over 1 to 4 weeks once sheep are removed from toxic pastures.

Preventative risk management plan recommendations include:

- Grazing young stock on 'safe' pastures during the PRGT high risk period,

- Completing all essential animal health handling procedures before the high risk period for PRGT in the autumn,
- Pasture re-establishment with cultivars of perennial ryegrass that do not carry the 'wild type' endophyte fungus.

Stocking rates

Weaned lambs (15 kg) growing at 200 grams per head per day have the equivalent feed requirements of 1.4 dry sheep equivalents (DSE). At 25 kg, this requirement has increased to that of 1.8 DSE (McLaren 1997). The stocking rate of pasture, annual or perennial, will depend not only on the weight of the lambs and their feed requirements, but also factors that affect dry matter production. This will include soil phosphorus levels, length of the growing season and rainfall. In north east Victoria where the growing season might typically be from April through to October (7 months), the stocking rate might be 16 DSE/ha providing that soil phosphorus was at least 20 mg/kg (Saul *et al.* 2002). Shorter growing seasons or poorer soil fertility will reduce the carrying capacity.

Supplementary feeding

Supplementary feeding of lambs is not essential but may be practiced if pasture supply cannot be maintained to a sufficient level, lambs are being finished outside of traditional pasture finishing periods, or faster weight gain is required. As grain feeding is an expensive input in terms of grain costs, time and labour, it is critical that producers calculate the costs and potential returns prior to commencing grain feeding. Meat and Livestock Australia has a resource guide for grain finishing of lambs which is applicable to all producers (Bell *et al.* 2002).

Animal health

In an organic system there are three potential issues with regard to animal health. Primarily, weaned lambs are prone to the range of sheep diseases that are managed through vaccination in conventional systems. Whilst vaccination may not ordinarily be practiced in an organic system, it should be conducted if there is a history of the clostridial or cheesy gland diseases on the property. Vaccination will not affect the organic status of the lamb, providing that a veterinarian's certificate indicating the presence of the disease on the property is obtained. The clostridial diseases include enterotoxaemia (pulpy kidney), tetanus, blackleg, black disease and malignant oedema. If a 6 in 1 vaccine is used, then protection against cheesy gland (*Caseous lymphadenitis*) is also covered. Producers should check the organic standards carefully with regard to the use of vaccination for disease prevention.

Secondly, signs of intestinal parasites in weaned lambs must be monitored during the finishing period. Clinical signs may include weight loss, scouring, dags, and general ill thrift. Monitoring may include regular observation for scouring, and taking fecal samples for intestinal parasite egg counting and identification.

Drenching for intestinal parasites in weaned lambs is not approved in an organic system so monitoring becomes critically important. Maintaining appropriate rotational grazing practice, monitoring for scouring and reducing stocking rates can all have a positive effect on intestinal parasite load. Further information on this subject can be found in the Agnote AG 1268 Organic Farming: Internal Parasites in Sheep.

Thirdly, lamb health may be affected by grass seeds working their way into the lamb's skin. This problem can be managed in an annual system by ensuring that lambs are ready for sale before annual grasses commence seeding. In a perennial system where the finishing period may coincide with annual grass seed production, lambs can be shorn or pastures topped to reduce the risk of seed contamination. Intensive grazing management to ensure that annual grasses are prevented from seeding can also reduce grass seed contamination. Penalties can apply for damaged lamb skins.

Marketing organic lambs

The organic market for lambs requires lambs to have specific weight and fat score measurements. Most purchasers of organic lamb pay producers according to a grid where deductions occur for heavy and light lambs, and for lambs that are either too fat or too thin. An example of a grid is shown in Table 1. The most important factor in marketing organic lambs is for producers to build a good relationship with the processor and/or retailer so that feedback can be obtained as to the quality of the carcase.

Regular monitoring of lambs to ensure they comply with fat score requirements is recommended. Generally, lambs between 40 and 45 kg liveweight will result in a carcase within the premium specification range of 18 – 24 kg carcase weight. This premium weight range may alter depending on the supply of lambs during the season so it is essential to know the specification that is being aimed for. Monitoring to assess fat scores can be easily learnt and practiced by producers in the field (White and Holst 2006). For a full description of how to fat score a lamb, read NSW DPI Primefact 302.

Table 1. An example of a purchasing grid for prime lamb.

| Specification | Weight range (kg) | \$ deduction |
|------------------|-------------------|--------------|
| Weight | <17.1 | - 0.55c |
| | 17.1 – 18.0 | - 0.45c |
| | 18.1 – 19.9 | - 0.25c |
| | 20.0 – 24.0 | 0 |
| | 24.1 – 25.0 | - 0.25c |
| Fat Score | >25.0 | - 0.35c |
| | 1 | - 0.30c |
| | 2 - 3 | 0 |
| | 4 + | - 0.60c |

Economic returns

Returns from lamb production will depend on the supply of lambs, demand for the product and what the current lamb purchasers are prepared to pay. Producers should ensure that they have a purchaser and a processor organized prior to the end of the finishing period. An organically certified abattoir is required to process organic lamb. The majority of organic lamb supply is sold into the domestic market with only minor consignments being sent for export.

Through the Naturally Victorian Initiative, gross margin returns from organic lambs were calculated in 2005 and 2006 for both annual and perennial pasture finishing systems. These returns are based on lambs finished at Rutherglen, slaughtered at Wodonga and sold into the Sydney retail market. Returns from the annual pasture finishing system are presented in Table 2 and from the perennial pasture finishing system in Table 3.

Table 2. Gross margin returns (A\$) from lambs finished on annual pasture at Rutherglen.

| Measure | 2005 | 2006 |
|------------------------------|--------|----------|
| Organic supplement | | |
| Per hectare | 201.06 | 169.02 |
| Per lamb | 21.45 | 18.03 |
| Per kilogram weight gain | 0.8249 | 0.8084 |
| Organic No supplement | | |
| Per hectare | 137.57 | 223.20 |
| Per lamb | 14.67 | 23.81 |
| Per kilogram weight gain | 0.6670 | 1.2336 |
| Conventional | | |
| Per hectare | 166.84 | - 64.48 |
| Per lamb | 17.80 | - 6.88 |
| Per kilogram weight gain | 0.6356 | - 0.3118 |

Table 3. Gross margin returns (A\$) from lambs finished on perennial pasture at Rutherglen.

| Measure | 2005 | 2006 |
|------------------------------|--------|--------|
| Organic supplement | | |
| Per hectare | 126.76 | 313.88 |
| Per lamb | 13.52 | 33.48 |
| Per kilogram weight gain | 0.7954 | 2.0048 |
| Organic No supplement | | |
| Per hectare | 99.35 | 371.25 |
| Per lamb | 10.60 | 39.60 |
| Per kilogram weight gain | 0.7160 | 2.6225 |
| Conventional | | |
| Per hectare | 152.91 | 222.18 |
| Per lamb | 16.31 | 23.70 |
| Per kilogram weight gain | 0.7414 | 1.4208 |

Supplement refers to additional grain feeding using organic soybean meal. The calculations take into account pasture establishment costs but exclude organic certification costs due to the small number of lambs in the project.

Organic certification costs would reduce, per lamb, with larger numbers of lambs. The returns below were influenced by the specific farming systems and seasonal conditions.

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- White, A. and Holst, P. (2006) Fat scoring sheep and lambs. New South Wales Department of Primary Industries Primefact 302. ISSN 1832 – 6668.

Certified Organic Abattoirs in Victoria

- Loddon Country Lamb, Pyramid Hill, 0427 574 941
- Norvic Food Processing, Wodonga, (02) 6055 0226
- Radford's Abattoirs, Warragul. (03) 5623 5546

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