

D P I R D



Lamb Backgrounding Report

August 2017

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Executive Summary

Lamb backgrounding has grown considerably over the last 20 years and particularly in the last 10 years in Victoria.

- ❖ In recent years, approximately 8 million prime lambs are born each year
- ❖ Primarily they are born in winter and spring
- ❖ About 4 million are backgrounded over the summer autumn to be finished either in those seasons or early winter.

Lamb backgrounding occurs in 3 main regions with very different production systems.

- ❖ About 3 million lambs are backgrounded on summer green fodder crops and even grain backgrounding on pasture in the high rainfall zone to the south and west of Bendigo, which is south of the Great Divide.
- ❖ Nearly another 1 million lambs are backgrounded predominantly on lucerne pastures in the Eastern Riverina, and this occurs on both sides of the Murray River.
- ❖ The balance, which is lost in rounding, are backgrounded in the Wimmera, typically on Faba Bean stubbles that can also finish the stock at times.

In all backgrounding zones more feedlots have been set up and more grain is being used to ensure that the lambs consistently reach their backgrounding and finished weight targets. This is particularly occurring when lambs are sold forward at attractive rates or the producers consistently get a premium over normal market values from processors or supermarkets due to being preferred suppliers. This trend shows no sign of slowing up, particularly with cheaper grain prices over the last year or so.

Gross margins prepared given best guess scenarios using 10-year average real commodity prices for meat, grains and skins indicated good profitability was generated by backgrounding in all three Victorian zones with typical Merino cross genotypes.

- ❖ The backgrounding and finishing gross margin generated was at least \$25/lamb, which resulted in a return of capital invested in lamb, inputs and labour of at least 25%.
- ❖ The best returns were generated in a typical Wimmera backgrounding and finishing operation with a gross margin estimated to average \$34.12/lamb with a

37% return. This is mainly driven by the availability of low cost, high quality Faba Bean stubbles.

In the last 3 years the continual emergence of the Airfreight market has impacted on the value of store lambs that are normally backgrounded on the farm of origin or purchased by others to background. There are those that see this market growing further. Nevertheless it has resulted in lower margins over the last 2 years in particular. Many farmers undertaking backgrounding have adjusted by backgrounding more lambs, hence achieving their gross income targets in that way. With forward contracts they are able to have the certainty to trade on thinner margins than they have been.

This pattern of trading on thinner margins over the last two years is indicative of producers accepting that this enterprise is attractive, but can have its ups and downs. This is a clear indication for a lot of these producers that is not just an opportunistic enterprise, as it mainly was in the past.

But lambs are also taken by the Airfreight market in the backgrounding and finishing stage of lighter lambs over the summer and autumn that would normally have been taken longer to finish as a trade lamb.

All participants in this backgrounding enterprise, whether the farmers, the stock agents or consultants all see forward contracts integral to the success of this industry and why it has grown so much in recent years. Indeed, this is why producers have been prepared to trade at lower margins over the last two years, as much of the profit is locked in before they commence backgrounding and just need to achieve animal performance targets to reach profit targets.

The Western Australian lamb industry is currently in a similar position to that of the Victorian industry 20 years ago. That is, there is a large supply of finished lambs in the spring, and while prices vary on a seasonal basis that reflects the seasonal supply of lamb, they currently do not allow producers to profitably background and finish lamb in their own location, mainly in the Great Southern using grain or cereal stubble to background lambs.

There are considerable benefits potentially for the WA industry to have a more even supply around the year: -

- ❖ Processors would be able to better supply customers and perhaps attract new markets as a result
- ❖ Processor capital could be more efficiently utilised hence improving profitability

- ❖ The potential for more lambs to be produced and finished, hence growing the industry overall with the result of increasing the overall value of agricultural production in WA.

Taking the Victorian backgrounding and finishing industry experience to WA, developments that may allow the prime lamb industry to flourish more: -

- ❖ The high rainfall zone south and west of Boyup Brook could see lambs backgrounded cheaply for longer on pasture given the longer growing season and supplied by store lambs by regions such as the Great Southern.
 - Silage feeding systems could also be utilised, which could mean very high quality regrowth pastures in spring and strong backgrounding performance in the summer and autumn using silage.
- ❖ The south coast sand plain could see more lucerne planted, but this now has to compete with crop, which may be problematic given the current focus on crop and freight costs
- ❖ The Central and Southern wheatbelt doesn't tend to have legume crops in the rotation, hence limiting the potential to cheaply background lambs.

Introduction

Report objectives

The objectives of this proposal are to provide a description of typical lamb backgrounding enterprises in Victoria and to present projected financial returns from these typical operations.

- ❖ The main flow of store lambs from southern Victoria to various backgrounders will be described and the time of the year the backgrounding occurs
- ❖ The main 3 types of backgrounding enterprises operating in Victoria will be described. However, it should be noted that there are exceptions to this and there is a lot of variation within each of these major backgrounding enterprises.

Gross margins are calculated for each typical backgrounding enterprise.

Further, the following is also outlined and described: -

- ❖ Reasons why lamb backgrounding has evolved in Victoria to the extent it has
- ❖ The extent of forward lamb price contracting
- ❖ Alternative livestock ownership structures that are being utilised and their extent
- ❖ These backgrounding operations will be put in context of WA and the potential for WA to adopt similar backgrounding systems

Background

Currently, lamb production in WA is heavily skewed to finishing suckers off pasture in the spring. There is much reduced supply during summer, autumn and winter. Processors desire an even supply of lambs throughout the year to satisfy their customers better and to utilise their capital investment more efficiently.

However, a report by John Young for DAFWA, found that lamb turnoff in spring versus other times of the year was more profitable, based on historical WA lamb prices and the variation around the year of those prices. In essence, he found that prices increased from spring to other times of the year by an average of \$0.16/kg DW/month, or approximately a premium of 3.3%/month.

WA's lamb industry currently is heavily weighted to finished lamb sales in October/November period with a large flush of lambs onto the market at that time.

In contrast, using the MIDAS model for the Great Southern and Central Wheatbelt, he estimated that a premium of up to 6.2%/month was required to match the spring turnoff of lamb. Clearly for many producers the premium required to be profitable from out of season turnoff, exceeds the actual premium paid by the market.

John Young's MIDAS modelling indicates that average seasonal price variation does not provide a margin that allows for profitable out of season lamb production for WA farmers

The modelling exercise that John Young reported was mainly based on the producer altering their production system to target out of season production. Another way of achieving out of season supply, is for producers not to finish lambs out of season, but to sell their lambs as stores and have another producer background them till they are finished out of season.

This system would have the advantage of potentially fulfilling the processors desire to have a more even lamb supply through out the year. It may also enable producers that currently don't produce lamb to utilise farm resources that are currently under-utilised, and that store producers may not have access to. It may also mean that new on-farm resources could be developed that could enable profitable lamb backgrounding to be undertaken that is profitable for the backgrounder given past price differentials.

A move to more even lamb supply throughout the year would appear to be attractive to DPIRD as it would mean: -

- ❖ Processors would be more competitive in domestic and overseas markets by being able to supply reliably most of the year, hence enabling larger throughput of lamb in absolute terms.
- ❖ More farmers may get into lamb production from being either supplying store lambs or backgrounding them, hence overall farm productivity and profitability could be increased further.
- ❖ Hence state agricultural production would potentially be increased.

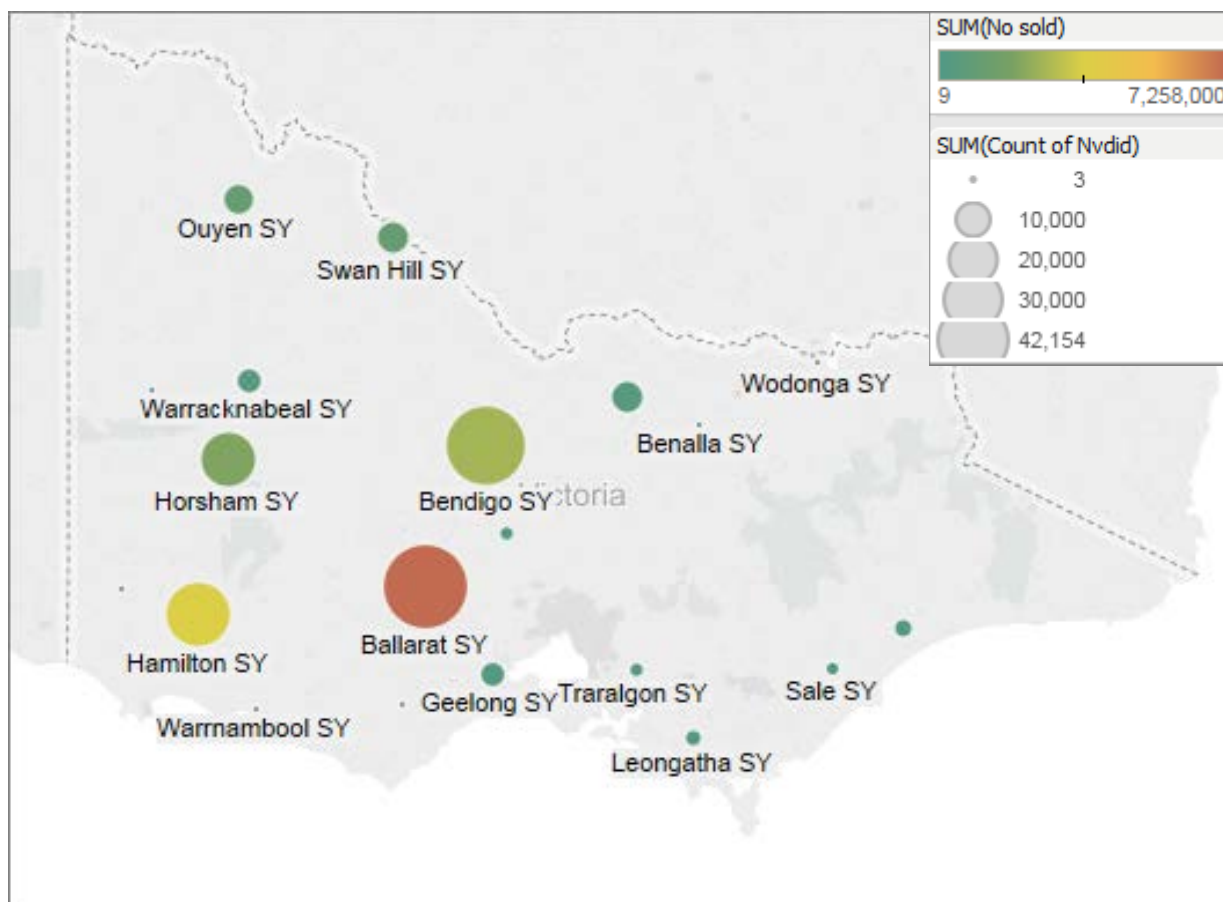
Profitable out of season lamb production in WA could result in processors satisfying customer requirements for supply around the year, better utilisation of their plant and equipment investment and grow total WA agricultural output

The development of a successful lamb backgrounding industry may be dependent on farmers being convinced to change their system to produce stores and for others to invest in a new backgrounding enterprise.

Similarly, lamb backgrounding 20 years ago was not undertaken by many farmers throughout Victoria. Lamb supply was dominated by spring turnoff, in much the same manner that currently occurs in WA.

It probably not possible to say precisely why lamb backgrounding has evolved to the extent it has over the 20 years and particularly in the last 10 years. The main perception is the developments of forward contracts allowing the pro-

Location of Victorian saleyards



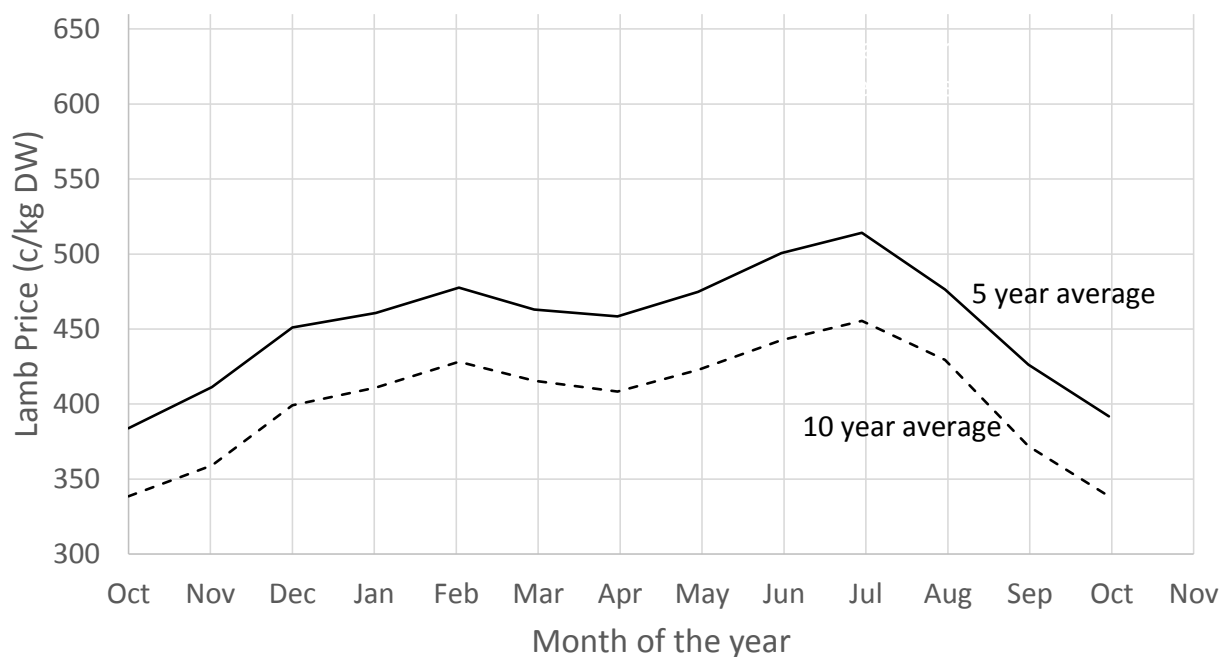
ducer to lock into these and hence into a profit when the store lamb and feed was purchased, if the latter was required.

Furthermore, the fact that a price was signalled that gave other producers confidence to purchase lambs when they had not taken out contracts or had only taken out contracts for a minimal number of lambs. Processors offered the forward contracts as a way to continually supply lamb to their customers and to better utilise their processing plants. As each year passes, it seems farmers have done their sums and have seen an opportunity to profit from backgrounding lambs. There wasn't a sudden surge of backgrounding activity, but rather a gradual buildup of more farmers participating in this enterprise and those participating have got bigger. Some farms are turning over very large numbers of lambs, by backgrounding and finishing 10-20,000 lambs.

Forward contracts are very important in underpinning the backgrounding and finishing stage. Stock agents contacted estimate that about 70% of lambs backgrounded are forward contracted and doubt whether a lot would be backgrounded if it wasn't for the forward contracts on offer. Forward contracts allow the farmer to know the feed cost, know their likely ability to background the lamb ready for finishing and the sale price with a forward contract. Thus,

Victoria was in a similar situation 20 years ago, but processor forward contracts enabled growers to have confidence in buying store lambs to background and finish knowing that the end price locked in a profit.

Western Australian price variation around the year

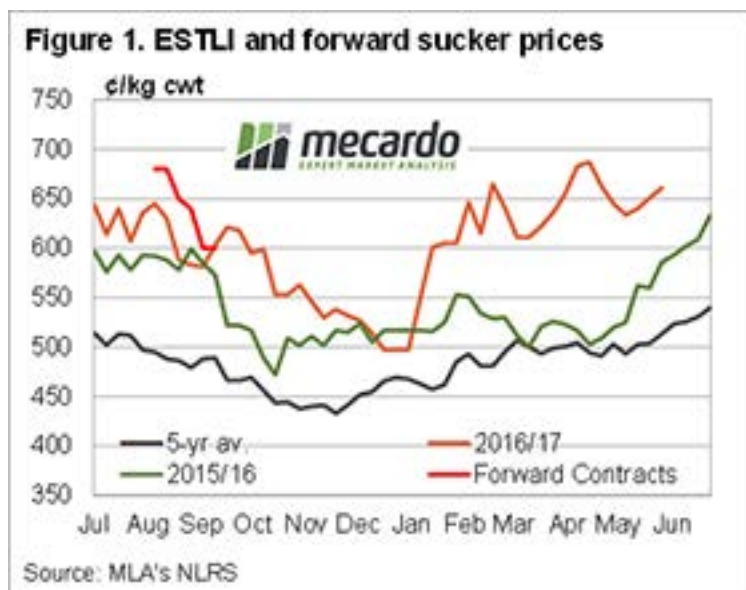


if the purchase price (or the store price if backgrounding their own lambs) allows a margin, the producer has confidence to commit to purchasing and backgrounding the lambs.

The farmers contacted as part of this study were all adamant. They would not be backgrounding lambs without a forward market and all apart from one sold a large portion of their lambs forward. The producer that didn't sell forward, said that the knowledge of the forward contract price levels for the following summer and autumn were important in his decision making. The graphs on the following page indicate the relative value of forward contracts at different times of the year. Usually, they present good value in comparison to the normal market seasonal variation that makes it attractive to growers to background lambs.

At this point in time, there are very few alternative livestock ownership models operating in Victoria. The dominant ownership of the livestock is the backgrounding farmer. This is also the opinion of a number of consultants and stock agents contacted. It is also quite possible to breakdown the ownership of the lambs, in a similar manner to the cattle industry, to one who breeds the lamb, one who backgrounds the lamb and another final owner who finishes the lamb. Currently the dominant model is for one farmer to breed the lamb, then another one to both background and finish it. However, as outlined previously, there are a number of lambs kept as stores, backgrounded and fed by the one farmer in one location.

Farmers, consultants and stock agents were adamant; lamb backgrounding in Victoria would not exist without attractive forward contracts.



While lambs backgrounding and finishing of store lambs has been more opportunistic in the past, and there are still farmers who view as such, more are making it part of their farm business enterprise, each and every year.

Most lambs destined for backgrounding that are purchased as stores, are purchased in the late spring when the flush of lambs hit the market. But lambs will be purchased at other times of the year depending on pricing and availability.

Previous reports commissioned

The report prepared by John Young assumed a period of backgrounding on crop stubbles or dry pasture and then the lambs were finished in a feedlot. As outlined later in this report, this is similar to a number of backgrounding operations in Victoria, but not the majority of operations.

John Young's report also highlighted the modest weight gains on stubble or dry pasture over WA's long summer.

While most prime lamb enterprises in Victoria are running Merinos, the genetic makeup of much of the WA flock is nearer to a dual purpose sheep, rather than a specialist fine wool sheep, as tends to be run in Victoria by the majority of Merino producers (but not all).

The report highlights limitations for putting weight on the store lambs on crop stubbles or dry pasture in the Great Southern and Central Wheatbelt. This is similar to what one would expect on cereal stubbles in Victoria.

In essence, price appreciation of 3.3%/month occurs, but a price appreciation of nearly double that is required to breakeven with selling a lamb as a sucker off green feed in WA.

This equates into price appreciation of 18.6% over 3 months and 37.2% over a 6 month period. The WA market lamb price appreciation from spring to summer/autumn/winter is not dissimilar to the Eastern States market as outlined below.

Geoff Duddy reports highlights that



with historical variances between WA store lamb prices and trade lamb prices that there is a loss from feed lotting the store lamb, despite a historical price differential of about \$55/lamb by the time full costs are accounted for.

Victorian backgrounding industry overview

There are an estimated 8 million prime lambs produced in Victoria every year. The majority of these, which Agriculture Victoria estimate at 80% of them, are born in the regions of Victoria south and west of Bendigo. They also estimate that 50% of these, or 4 million lambs are backgrounded and finished before finding their way to abattoirs. Conversely, 50% or 4 million lambs are sold off the farm straight to the abattoirs in the spring off the ewe.

It is estimated that that the vast majority of store lambs, approximately 3 million, are backgrounded and finished before being slaughtered in the southern high rainfall zone. Nearly 1 million lambs are backgrounded and finished predominantly on lucerne based pastures in the Eastern Riverina in northern Victoria. The remainder, which is a minor share, are backgrounded and finished on stubbles in the Wimmera.

All these figures are best estimates by Agriculture Victoria staff and cannot be assumed to be free of error. However, due to the familiarity of Agriculture Victoria staff with stock movements, I believe these figures should certainly be considered “ball park”. Note, with the introduction of EID in 2017, much more precise data will allow accurate analyses to be performed and elicit the real numbers over the next two years.

The major Victorian saleyards, with their associated throughput indicated by the size of their dots can be viewed in the figure above on page 9. The biggest four are clearly Ballarat, Bendigo, Hamilton and Horsham.

About two thirds of abattoir lamb slaughter are now accessed directly off the farm. Thus saleyards purchased to the abattoir are a smaller part of their requirements than in the past.

The above graph on page 10 indicates both the 5-year and 10-year average lamb prices for WA, from John Young’s study. Although expressed slightly differently, a similar price pattern is apparent to the Eastern States lamb price seasonal variation, see page 23.

John’s report also highlighted that lambs by the end of October were about 5 months old after lambing in May/June. At this point the carryover lambs were about 35 kg. This is similar to store lambs that are purchased for backgrounding in Victoria, whether they stay on the farm or are purchased from another farm. Note, that the majority of lambs in Victoria are still Merino crosses.

Agriculture Victoria estimate that about 50%, or 4 million, of the 8 million prime lambs produced in Victoria are backgrounded and finished out of season before being slaughtered.

The majority of these lambs, about 3 million, are backgrounded in the high rainfall zone west and south of Bendigo, south of the Dividing Range. This region has a long growing season, which enables lambs to be backgrounded using cheap surplus spring feed.

About 1 million lambs are also backgrounded in the Eastern Riverina region on lucerne based pastures.

The remaining lambs are backgrounded on Faba Bean stubbles in the Wimmera.

More detail on monthly lamb price variation over the last 10 years in Victoria is presented further below on page 23.

The Airfreight market has also been growing in Victoria, resulting an increasing number of store or partially finished lambs being purchased for this market. Over the last 2 years, it has out pressure on the store lamb price, with the light lamb basis to the trade lamb price diminishing.

It is worth noting that the Airfreight market requirement has been increasing in importance in recent years, with very strong growth over the last 3 years. One stock agent estimates that 30% of all lambs were taken by this market last year. It's preferred carcase type is a 16 kg lamb with fat score 2.0, but it will take lambs from 12 to 18 kg dressed weight.

Agriculture Victoria's figures are based on previous years sheep movements. Whether the Airfreight will keep growing at the rate it has and indeed, whether it will be as strong as it has been last season is unknown.

However, if this market keeps growing strongly, as some suggest it might due to growing incomes and population in the Middle East, Mediterranean basin and south east Asia, it will make backgrounding less attractive, as many carcase types will meet this market's requirements at a point where they are also suitable for the store trade. Thus, it took lambs that would be normally backgrounded last spring and took them to Airfreight slaughter instead, as the buyers paid more than store buyers for this type of lamb.

High rainfall backgrounding

Description

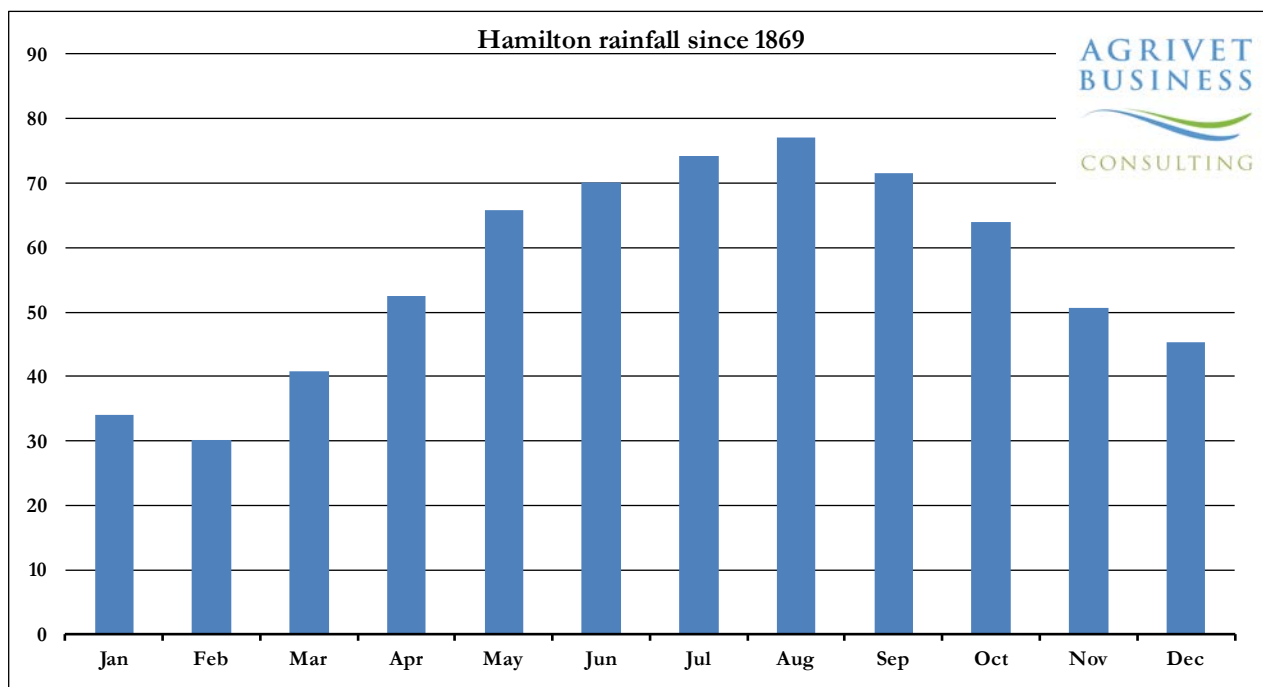
Outline of typical backgrounding enterprise

Generally, this area is defined as that part of Victoria that is south of the Great Dividing Range and these farms have a growing season of about 9 months, ranging from nearly 10 months in the south (close to dairying areas) to 8 months in the northern areas. Clearly the length of the growing season is a key determinant of the ability of lambs purchased or carried over to be backgrounded cheaply on pasture before entering a finishing phase on summer fodder crops or in a feedlot.

There is a lot of variation of lamb backgrounding enterprises in the high rainfall areas, which is mainly driven by the need to aim at higher carcase weights and year round supply so processors can supply their markets more reliably.

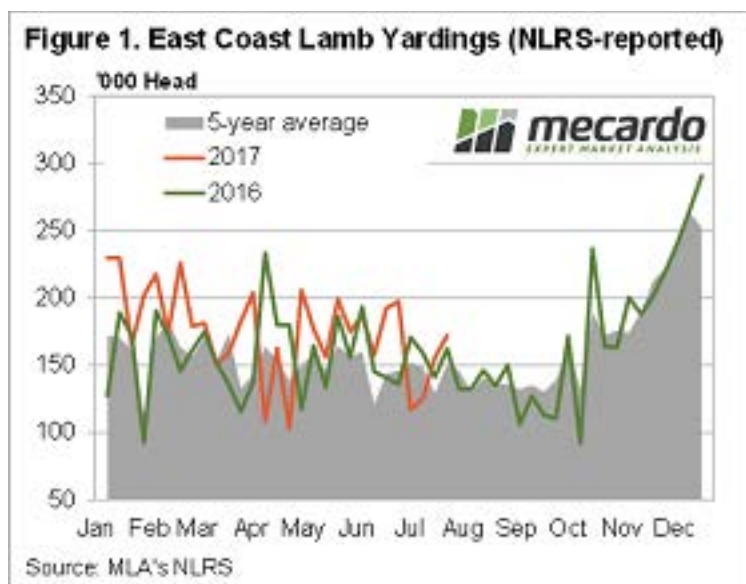
Typically, lambs are weaned off their mother in October/November, after lambing in July. Some producers lamb as early as June, with some more in August. There are some producers lambing as late as September, but not many. In the high rainfall zone, it is estimated from a number of sources that about

The High Rainfall Zone is characterised by a long growing season of 8-10 months, which allows store lambs to be backgrounded for some time on cheap surplus spring pasture, depending on location and seasonal conditions.



70% of the lambs are progeny of maternal breed ewes in the west of the zone, but Merino crosses dominate in the east of the zone.

Usually lambs are weaned and perhaps drafted at this stage into heavies and lights to prioritise green feed. Weaning weights are normally about 35 kg. The lambs will then continue to be grazed on high quality pastures and put weight on up to 40 kg by early January. On summer pastures, which are predominantly dry from early January to early April, will only see about 50 g/hd/day growth or 1.5 kg/hd/month, with even lower growth rates during March/April. Given the variability in lamb weights, there will be some lambs at the end of December/early January about 30 kg and others at today's typical trade weight or better at 45 kg liveweight (21 kg or better dressed weight).

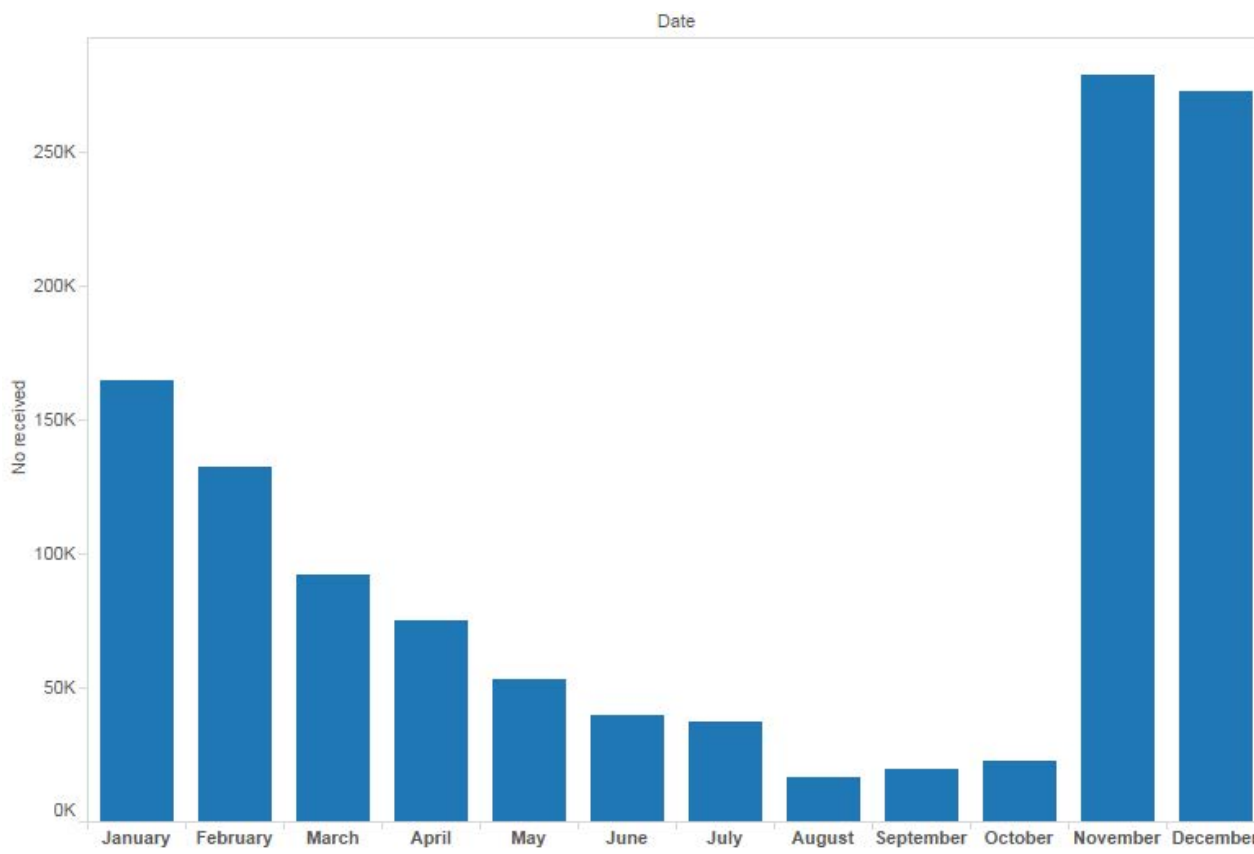


But if lambs are 30 kg at the start of January and they are only growing 1.5 kg/month, they will take a long time to finish on pasture; if ever as a lamb.

This is where a backgrounding and later finishing phase on green summer crops such as Brassicas or feed lotting the lambs will deliver them at killable trade weights later in the summer and early autumn.

Before the lambs are finished, most farmers, whether they have their own

Throughput of Hamilton saleyards around the year



lambs or have purchased stores, are starting to introduce them to feed before finishing them. This applies whether they are utilising fodder crops or feed lotting them.

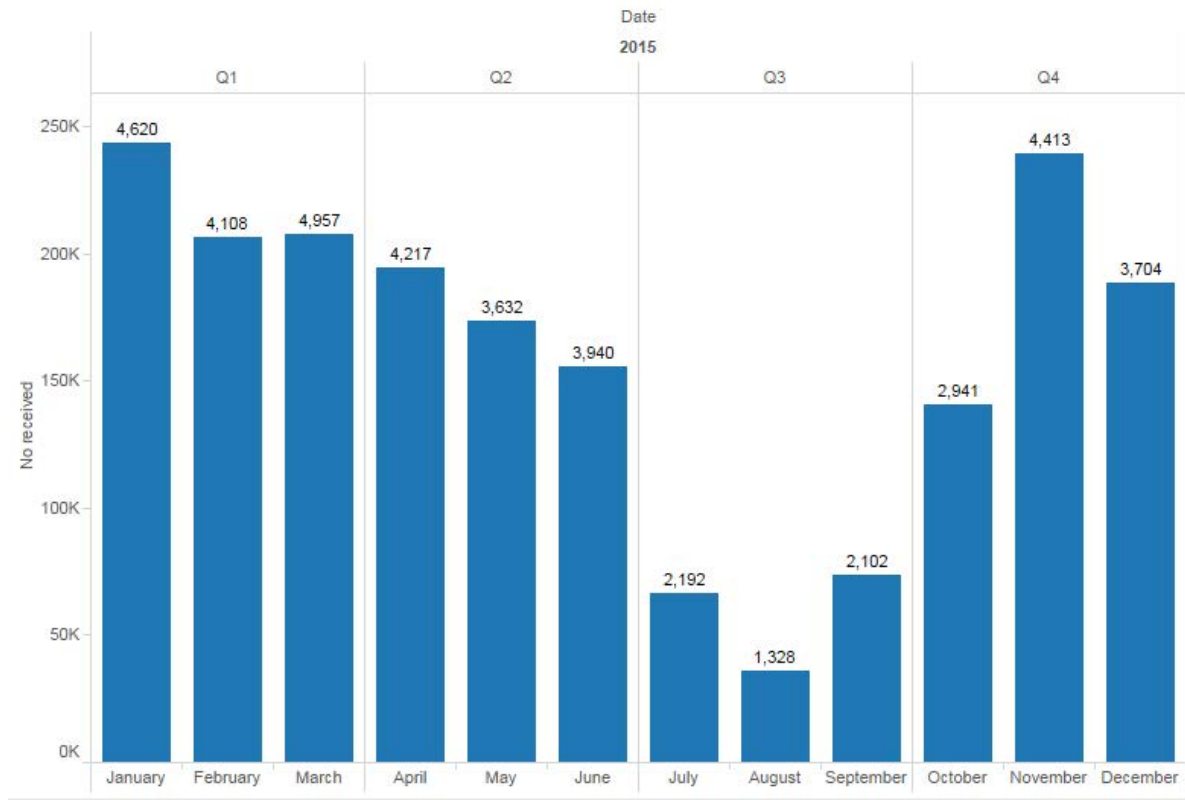
Some lambs are backgrounded on summer fodder crops to lift the growth rates up to 100 g/hd/day, which means the store 35 kg lambs are ready to be enter a feedlot or a better fodder crop to achieve growth rates of 300 g/hd/day or better for prime lambs out of maternal breeds.

Many southern high rainfall zone lambs are backgrounded on summer brassica fodder crops once pasture hay off in December/early January.

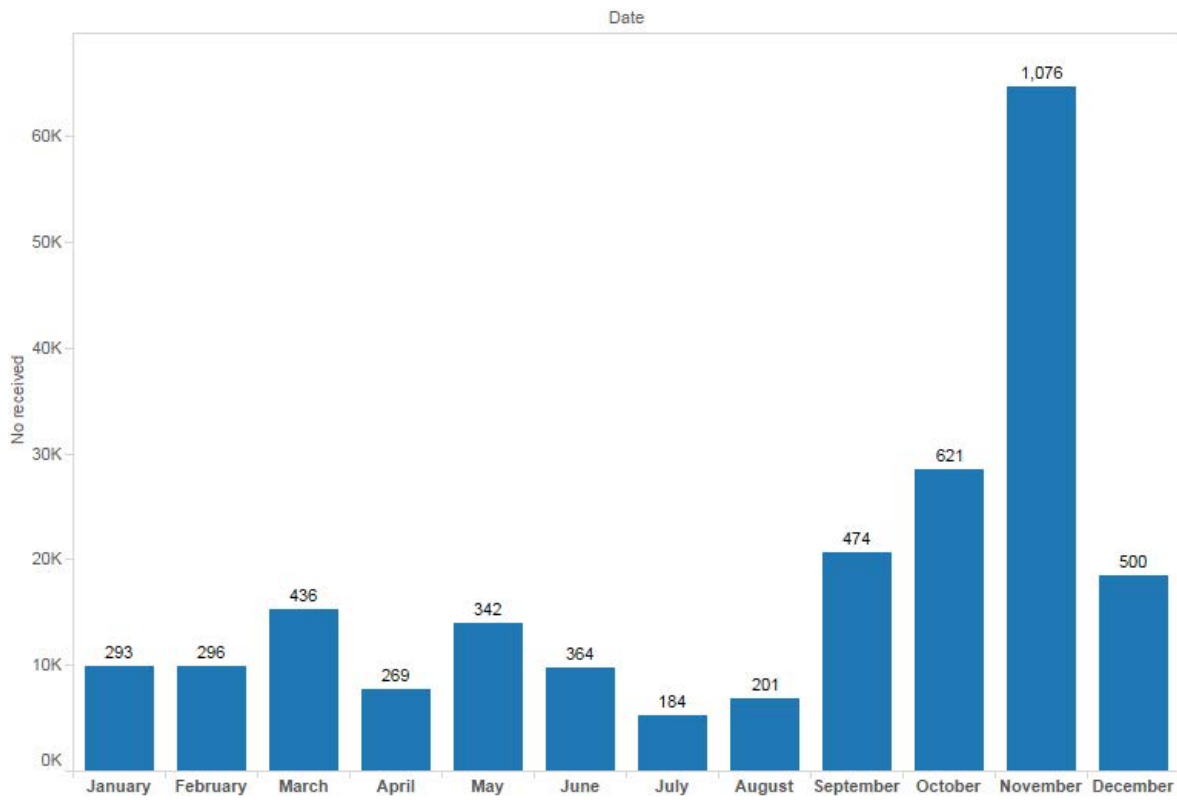
More high rainfall farmers are now using feedlots to finish stock, as fodder crops aren't totally reliable as a finishing system, particularly with some very dry years that has been recently experienced. They are now typically used more to background lambs before feedlot entry. Feedlots vary from full specialist permanent feeding areas, to feeding lambs in paddocks with self feeders. In many cases, this is in the summer crop paddock.

Some producers have also invested in cutting high quality silage early with additives and using that to both background lambs at lower feeding rates and to finish them at higher rates. While this should appear to be quite profitable, with total cost estimate of about \$180/t as fed, at this point in time there has yet to be consistent success with this approach with the few early adaptors that have implemented this system.

Throughput of Ballarat saleyards throughout the year



Throughput of Bendigo saleyards around the year



The rainfall for Hamilton, as an example of this region, is typified by a winter dominant pattern, but not classic Mediterranean. See graph above of Hamilton rainfall since 1869 on page 14.

Source of lambs

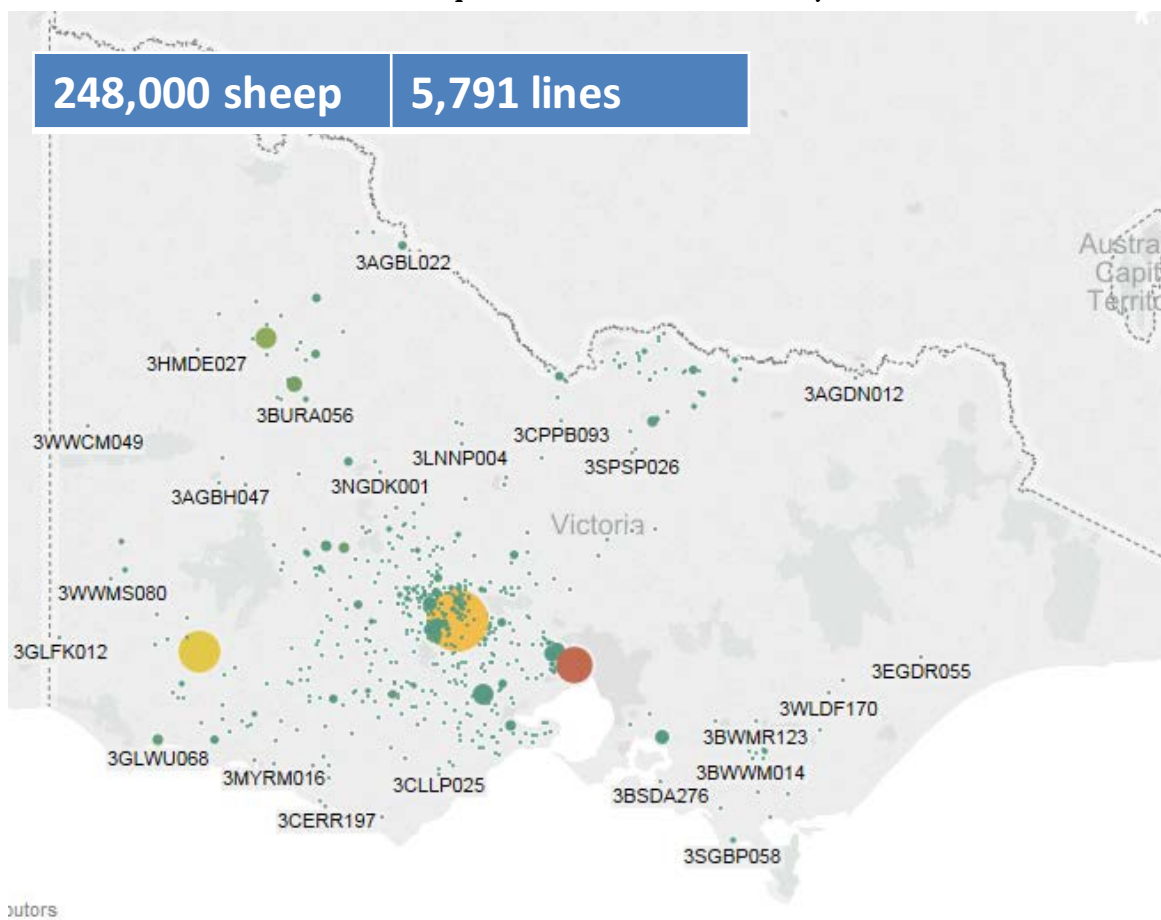
The figure above from Mecardo indicates Eastern Australian yardings on page 14 are indicative of lamb availability through the year, with the supply dropping slightly in the middle of winter, but otherwise reasonably even apart from a flush during November and December. This used to be more pronounced with a large spring flush of lambs similar to WA now.

Hamilton saleyards, see column graph above on page 15, has a pronounced flush of lambs in November and December. Ballarat and Bendigo supply is more even around the year, as can be viewed in column graphs on page 16.

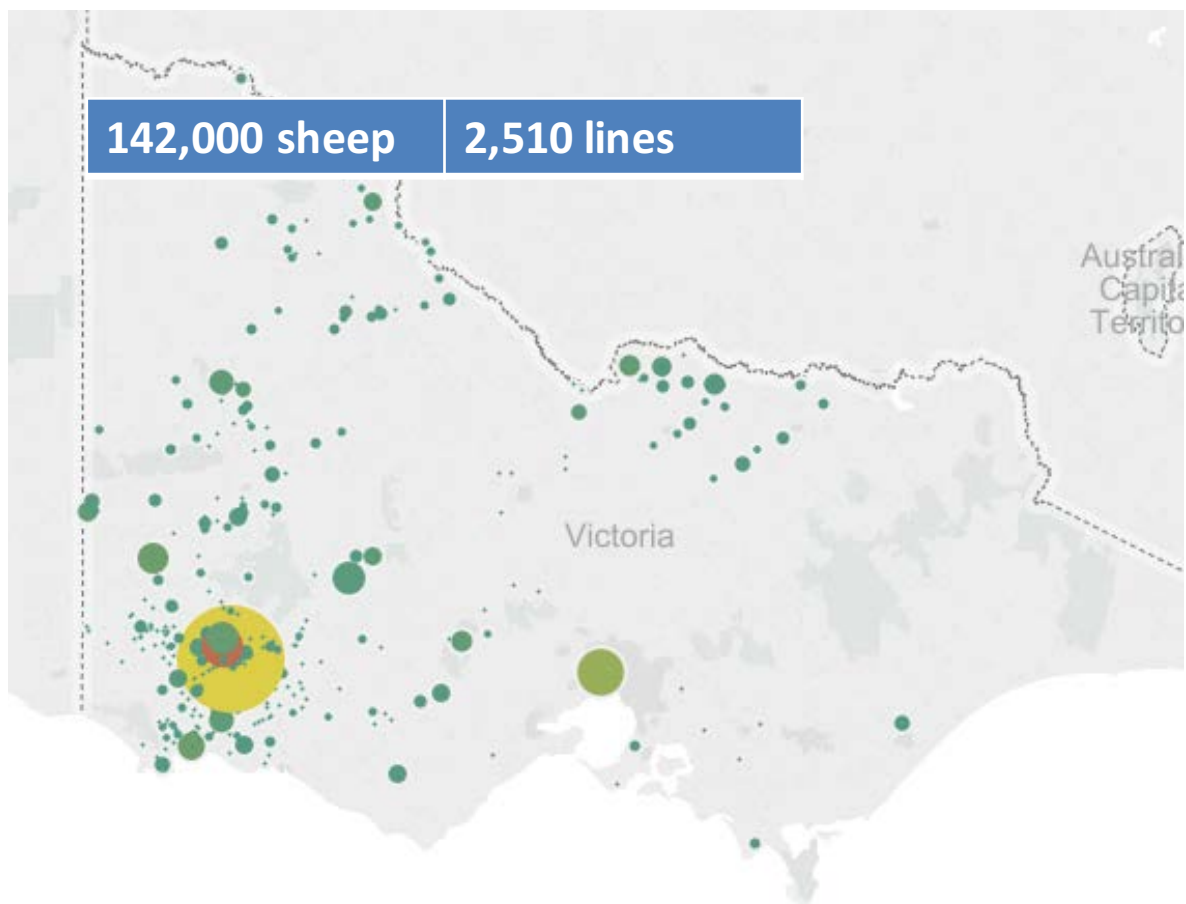
While Bendigo starts to see a rise in lamb yardings from September onwards until declining into December and subsequent months, Ballarat market's rise is slightly later. There is somewhat of an overlap between the different markets reflecting the different zones that tend to supply these them.

Most lambs backgrounded in the southern high rainfall zone are backgrounded in the same region with many held on the farm they were born on.

Destination of lambs to Victorian producers from Ballarat saleyards



Destination of lambs to Victorian producers from Hamilton saleyards



Lambs from Wagga also come onto the market about a month earlier than Bendigo, hence adding to the period of store lamb availability.

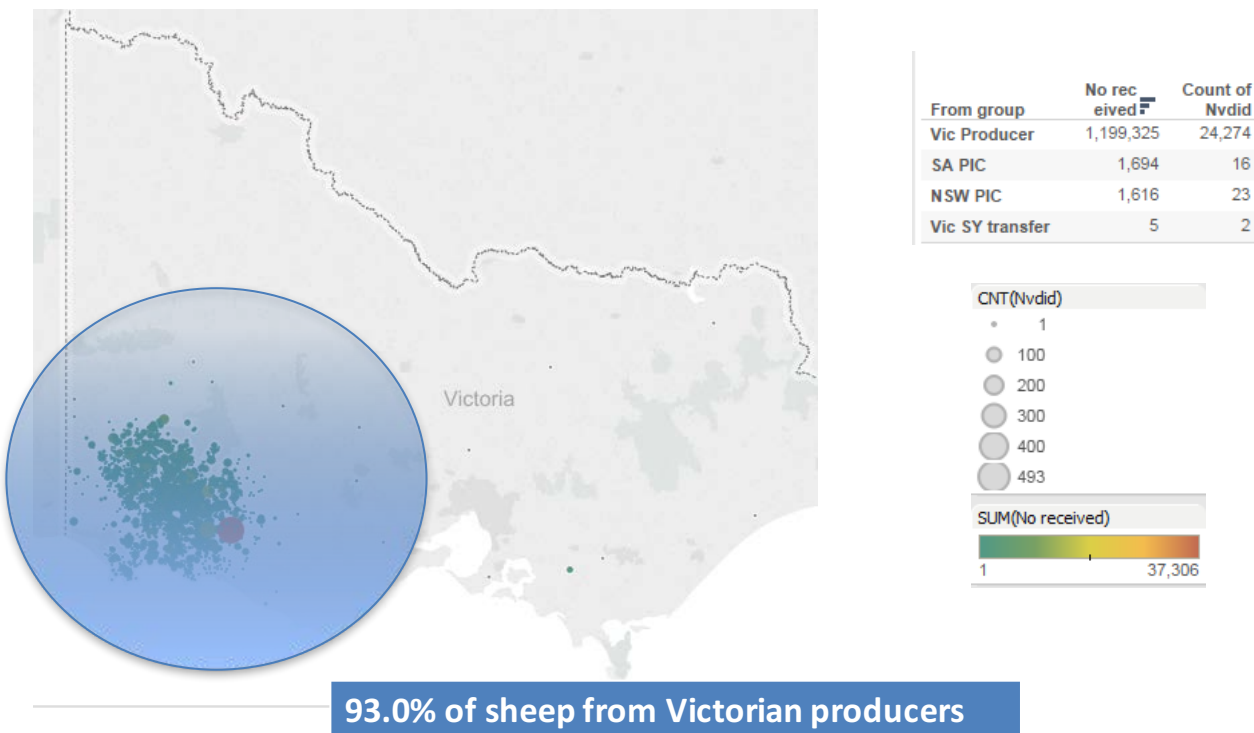
Lambs that are backgrounded in the Southern High Rainfall zone also are sourced from Bendigo and Ballarat saleyards as well as Hamilton. But some lambs come from NSW and SE of SA as well.

A lot of lambs are sourced from their own farm, but as can be understood from the graphs below, there is still movement of lambs from Ballarat and Hamilton saleyards into this high rainfall zone. It should be noted, that the lower South East of SA is contiguous with this zone and this area is similar to the Victorian high rainfall zone for backgrounding and finishing lambs, but a lot are sourced from within the South East of SA. But there is some movement that occurs over the border.

The graphs on page 17 & 18 (this page) indicate the source of lambs according to Agriculture Victoria going to Victorian producers. For example, the graph of sales to Victorian producers from Ballarat saleyards on page 17, indicates that a total of 248,000 lambs go to Victorian producers.

There is an estimated 142,000 sheep sold out of Hamilton sale yard, that go predominantly into the southern high rainfall zone south of the Great Dividing Range, but some are sold to the Wimmera, as well as the Eastern Riverina

Source of lambs to Hamilton saleyards



Unfortunately, while there is overall agreement about total numbers backgrounded and finished on farm, precise numbers of their source is not known by Agriculture Victoria or stock agents.

and less to irrigation areas along the Murray River in the north west of the state.

There is also a lot of movement of lambs from farm to farm, but Agriculture Victorian are not sure of accurate numbers. Agents tend to agree with the overall estimate of backgrounded lambs, but also are not really sure of how many stay on the farm of origin to be backgrounded or how many are moved direct between farm of origin to another backgrounding farm.

Estimate of lamb numbers

As noted previously, Agriculture Victoria estimate about 3 million lambs are backgrounded in this region of Victoria. It is the dominant destination of lambs backgrounded in Victoria including those bred on the same farm they are backgrounded on.

In northern parts of the High Rainfall Zone pastures will tend to be based phalaris, but perennial ryegrass and lucerne may feature occasionally. Summer fodder crops become rarer.

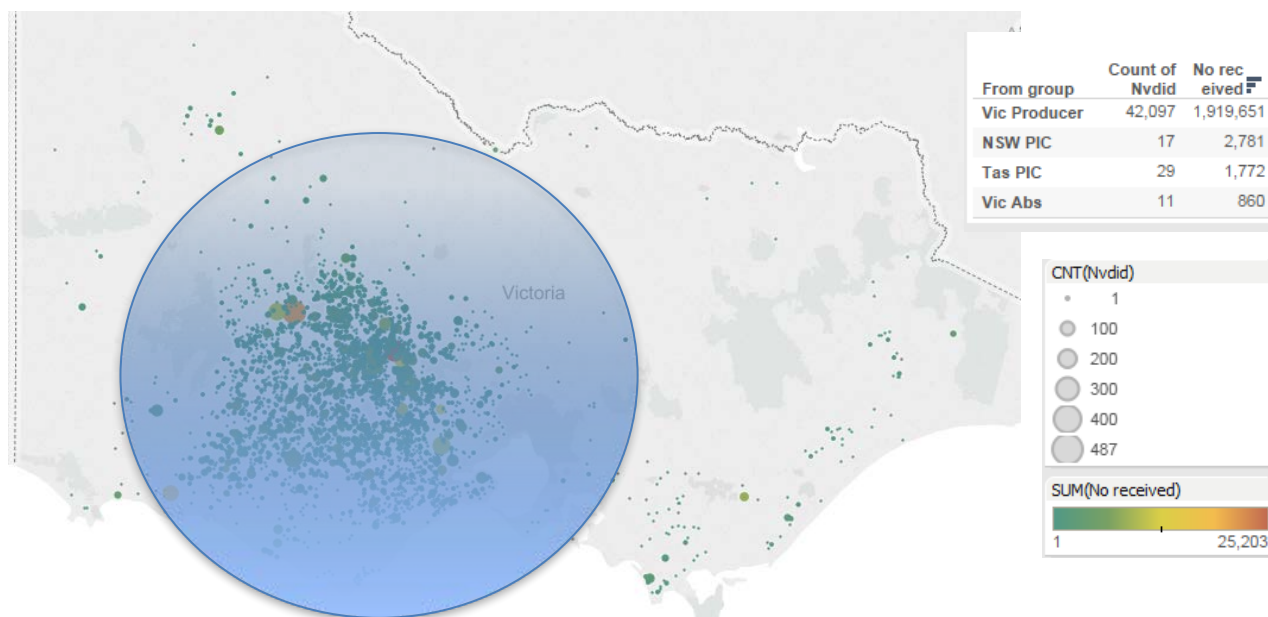
The graphs on this page and page 20 indicate where the lambs are sourced that go to Ballarat, and Hamilton saleyards. The first graph is for Hamilton saleyards and the second graph is for Ballarat.

Pasture types

There are a variations in the pasture base and specialist summer crops to background and finish lambs.

Firstly, in the northern regions of this high rainfall southern zone will have a pasture base more dominated by phalaris, sub clover and to a lesser extent Vic-

Source of lambs to Ballarat saleyards



99.7% of sheep from Victorian producers

torian perennial ryegrass. None of these pastures will support adequate backgrounding growth rates once the pastures dry off, particularly in late summer. With an 8 month growing season (haying off early to mid December) these pastures cannot support backgrounding growth rates of 100 g/hd/day from late December onwards.

While lucerne is also used on some farms, in general the water logging prone soil types of the whole southern high rainfall zone do not encourage its use.

In the more southern areas of this zone with a 9-10 month growing season, the pastures are dominated by perennial ryegrass and sub clover. Some white clover is used, but is a very minor part of the pasture mix. There is some use of annual and medium rotation ryegrasses to improve quality and growth in comparison to traditional ryegrass cultivars such as Vic ryegrass. In these districts there is also some use of modern, novel endophyte ryegrass pastures, but their adoption up to recently has been limited.

Thus green summer crops are commonly planted to provide more reliable backgrounding growth. The vast majority of these are some type of Brassica crop, such as rape or turnips. They are normally sown in the spring and are ready for grazing under normal circumstances by either late December or early in the New Year. There are other green summer crops possible and used from time to time, such as millet, sorghum and other specialist summer fodder crops. While they tend to perform well in wet summers, they are not fully reli-

The feedbase in the southern districts of the High Rainfall zone is dominated by perennial ryegrass, sub clover and many farms sow brassica crops as a summer fodder crop to extend high quality feed to the lambs over the summer.

Over recent years, with more frequent poor seasonal conditions, more producers have been using grain in the High Rainfall zone to finish lambs, and some have even back-grounding with grain.

There is a wide range of destinations for back-grounded and finished lambs. Even the Airfreight market has taken lambs after the back-grounding phase.

able to background lambs in every season due to dry summer conditions, and thus more producers are moving to backgrounding with grain so they will feed a low ration to acclimatise the rumen to the finishing ration at the same time.

For the same reason more southern producers have moved to a system of supplementing lambs heavily with grain in the finishing phase. There has been a greater use of specialist lamb feedlots and at the very least self feeders in fodder crops to boost growth rates. The release of Raphno Brassica in 2018 may result in more producers using this rather than feedlots, but at this point in time trial results would need to be confirmed on farms across the region.

There has been some producers cutting silage early with the use of modern additives and retaining high quality silage. It is early days with this technology, but it certainly appears to be very feasible to produce an excellent quality back-grounding ration, and with the addition of high quality grain supplements can finish lambs very effectively and cheaply. Further, early cutting has many other benefits such as high quality regrowth and weed control in future years.

End destination

Some producers have strong relationships with particular supermarkets and supply them exclusively so the supermarket has surety of supply and in return the producer has preferential pricing in comparison to the saleyard price. This is generally between 21-23 kg dressed weight.

In reality there is quite a range of final destinations for the backgrounded lamb. Some go direct to supermarkets at trade weights, some are exported at heavier weights and over the last two seasons more have been sold to the Airfreight market during the backgrounding phase once they are assessed as achieving fat score 2.0, rather than go into the final finishing stage. Growers have accepted price offers to this market due to a premium in price offered at various times.

High rainfall backgrounding gross margins

Best guess gross margins have been prepared using real 10-year prices for grain, store lambs, hay and trade lambs for Victorian markets assuming a store cross bred lamb is backgrounded and then finished on farm.

The base assumption is a lamb backgrounded on fodder crop and then finished in a-farm feedlot. This is to reflect what may be considered the typical situation, but as already outlined, there is a lot of different backgrounding and finishing systems that are used by many farmers in this high rainfall zone. The fodder crop is costed at \$250/ha, and runs 25 lamb/ha over summer and autumn. Thus, it is costed at nearly 7 c/day, which is based on grazing it for 150 days. See Appendix 1 for more detailed gross margin assumptions.

Lamb finishing budget and sensitivity

High rainfall zone

Client:- DAFWA

Comments:- 10-year real prices

Prepared By: Graham R. Lean BVSc, MAAAC

Date: 3-Sep-17

Store Period (Nov-Feb)	X Bred	
Lamb start weight (Nov)	28 kg	
Landed value of store lamb (\$/hd)	\$70 \$/hd	
Days on crop	50 days	
Amount of feed eaten (kg/day)	0.0 kg/hd/day	On crop
Total feed eaten (kg)	0 kg	
Total cost of ration (\$)	\$0.00 per head	
Final liveweight (kg)	38 kg	
L.W Gain (g/day)	100 g/day	
Fodder crop cost/hd	\$3.35	Share of crop costs
Starting fleeceweight (kg)	1.0 kg	
End fleeceweight (kg)	1.5 kg	

High Rainfall Zone, typical Merino X lambs result in a gross margin of \$25/lamb and a return on investment of 26% based on real 10 year average lamb and grain prices.

Sensitivity analysis indicates the impact of varying store lambs prices, finished lamb price and grain prices on profit.

Finishing Period Feb-March		
Store lamb start weight (Feb)	38 kg	
Days on feed	43 days	
Amount of feed eaten (kg/day)	1.7 kg/day	
Growth rate on feed (g/hd/day)	280 g/hd/day	
Final liveweight (kg)	50 kg	
Final dressed weight (kg)	23 kg	
Dressed price (c/kg)	537 c/kg	
Final carcass value (\$)	\$124 per head	
Total feed eaten (kg)	77 kg	
Total Cost of ration (\$)	\$21 per head	
Starting fleeceweight (kg)	1.5 kg	
Final Greasy fleeceweight (kg)	1.9 kg	
Store lamb buy-in price (from above)	\$70 per head	\$55,000/25,00
Labour cost (\$/hd)	\$0.56 per head	
Animal Health (\$/hd)	\$1.50 per head	
Shearing cost (\$/hd)	\$0.00 per head	
Crutching cost (\$/hd)	\$1.50 per head	
Freight - Out (\$/hd)	\$1.50 per head	
Death rate & shy feeders (%)	6%	
Total Costs (\$)	\$95.78 per head	
Value of skin in April -June	\$9.63 per head	
Total Income (\$) (skin, lamb)	\$120.31 per head	
Profit \$/hd	\$24.54 per head	
% return on investment	26% per head	
Marketed value of finishing ration	\$265 per tonne	

High rainfall	Lamb 20th	Lamb 50th	Lamb 80th
Gross margin	percentile	percentile	percentile
	(462 c/kg)	(545 c/kg)	(608 c/kg)
Grain 20th percentile (\$198/t)	\$27.76	\$34.15	\$30.14
Grain 50th percentile (\$252/t)	\$23.58	\$29.97	\$25.96
Grain 80th percentile (\$292/t)	\$20.48	\$26.87	\$22.86

The price assumptions are laid out above for this backgrounding and finishing gross margin. As most of backgrounded lambs are usually sold direct, minimal charges exist apart from statutory levies and freight. Most of the feed lotting

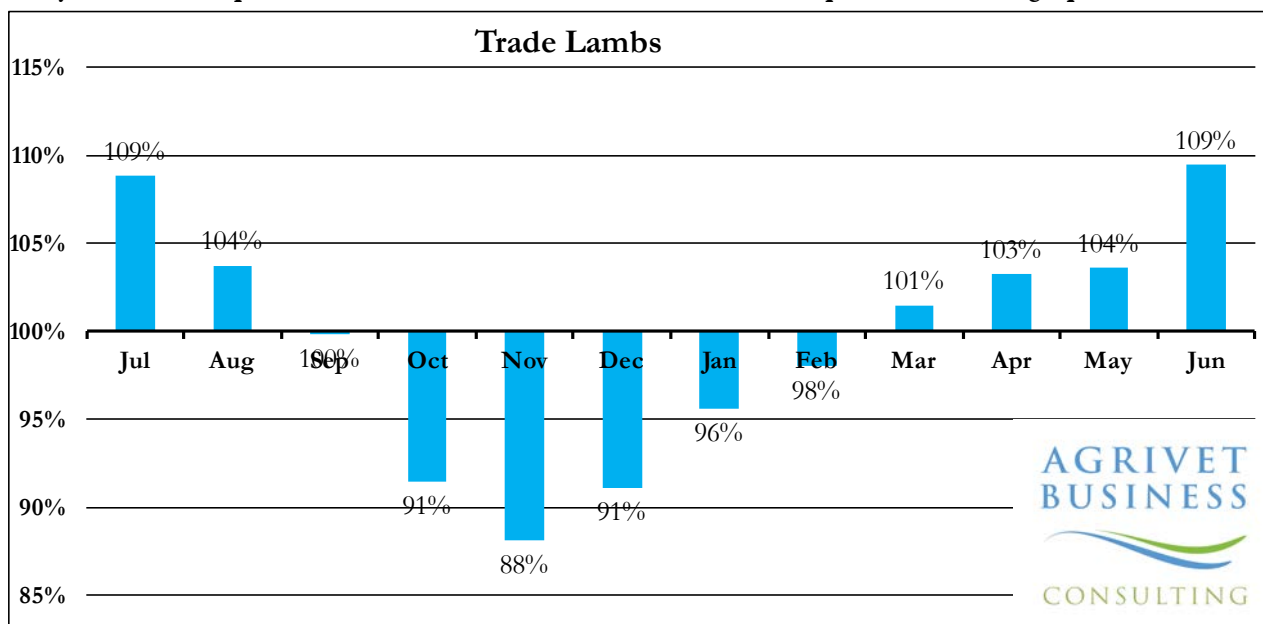
High rainfall Return on investment	Lamb 20th percentile (462 c/kg)	Lamb 50th percentile (545 c/kg)	Lamb 80th percentile (608 c/kg)
Grain 20th percentile (\$198/t)	36%	39%	29%
Grain 50th percentile (\$252/t)	29%	33%	24%
Grain 80th percentile (\$292/t)	24%	28%	20%

Grain prices have a large impact on the profitability of lamb backgrounding and finishing in the Victorian High Rainfall Zone.

assumptions have been kept similar to Geoff Duddy’s report for consistency, including Merino cross genetics, but some alterations have been made to keep it consistent with typical operations that I am aware of such as labour costs. However, terminal lambs out of maternal ewes would make daily gains in excess of 300 g/hd/day, thus the actual gross margin would be better than this for those genotypes.

The ration is a mix of 55% barley, 25% lupins and 20% hay instead of pellets, as the typical farm is using a simple grain ration rather than pellets, although these are also used. The feed conversion ratio is 6.1:1 as fed. However, some producers are consistently getting feed conversion ratios of less than 5:1, thus achieving a better gross margin than calculated above. This is probably due to growing evidence that modern maternal prime lamb genetics result in better feed conversion.

10-year seasonal price variation of Victorian trade lamb in comparison to average price



The store lamb price is assumed to be purchased when prices are at seasonal lows, hence is on average 12% lower in price than the finished price.

The following graph on this page highlights seasonal variation in trade lamb prices, which affects the lamb market overall. This is derived from 10-year real prices. This variation is built into the above gross margin as it assumes the main driver of price variation is supply variation and that it affects all lamb categories simultaneously.

The “typical” returns indicate an attractive use of capital, even assuming very conservative feed conversion ratios and more extensive dependence on feed lotting, rather than summer fodder crops for finishing.

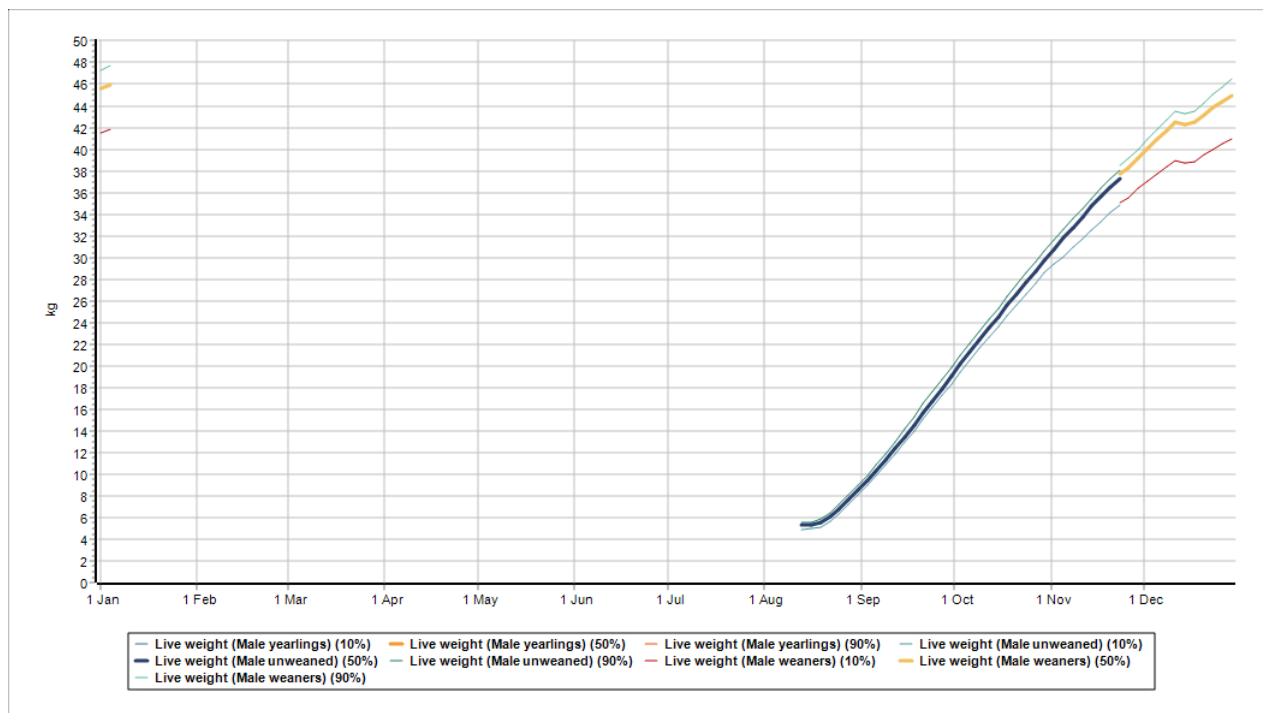
Seasonal variation and it’s impact

GrassGro predicts a difference in lamb weights by January of 6 kg between the 10th percentile season to the 90th percentile season over the last 55 years at Hamilton.

An assessment of the impact of seasonal variation based on a GrassGro simulation of a 1st Cross ewe enterprise at Hamilton between 1960-2015 with lambs normally turned off at 46 kg, or at 21 kg off the ewe in December after lambing in August. See graph below of lamb liveweight.

The medium wether lamb weights are depicted by the solid middle line, while the 10th and 90th percentile weights are found either side of the solid line. This means that in better seasons lambs could be turned off at nearly 48 kg and in the worst seasons, they might be turned off as little as 42 kg (19 kg dressed).

GrassGro simulation of a 1st Cross ewe enterprise at Hamilton with 10th, 50th & 90th percentile growth path of lamb weight



With a number of poor seasonal conditions experienced recently including the 2014 and 2015 springs that were on the 3rd and 2nd percentile of historical spring rainfall respectively at Hamilton, the farmers undertaking backgrounding and finishing were still able to be profitable. Some of the main factors behind this was a lower store lamb price. This was despite higher feeding costs due to higher grain prices and poorer pasture conditions resulting in lighter lambs as the pasture hayed off.

In summary, for backgrounders in the high rainfall zone, profitability was reported to be maintained, despite the impacts of seasonal variation. The main risk is probably present in every year; paying too much for the store lamb, hence cutting the profit margin down.

The South West region on WA to the south and west of Boyup Brook has some similarities to the Victorian High Rainfall Zone.

Comparison to WA high rainfall zone

The obvious location for backgrounding and finishing lambs in WA in a similar way to the high rainfall zone of Victoria, would be the southern high rainfall zones west and south of Boyup Brook (long term annual rainfall 650 mm), where there is a growing season of 8 months or longer. The summer period is drier than the high rainfall zone of Victoria.

However, this is regarded mainly as an area suitable for cattle, thus sheep infrastructure may not be present on many farms for crutching, shearing (if necessary) and animal health procedures. Further, long season perennial grasses would be required to take advantage of the growing season. Past work published by CSIRO has established that Australian Phalaris persisted and grew well in this region. More recent research has show excellent productivity and persistence with winter active, Mediterranean sourced Tall Fescue at Kojonup with a shorter growing season.

While these pastures may be able to background the lambs for longer into the late spring and summer, as they hay off around the end of November, this would need to be complimented by a backgrounding ration and finished on grain. This is due to the dry WA Mediterranean summer probably not supporting sufficient growth from green fodder crops, although Raphno Brassica might be a possibility in this environment. Another possibility may be standing crops, such as oats, to be fed off over summer.

Another way to take advantage of the longer growing season is to cut high quality silage early with additives, as mentioned previously in this report. This could mean that lambs could be fed cheaply over the summer and autumn period, while still enabling the lambs to meet growth targets. More detail on this is outlined in early sections, but would appear to present a lot of promise for this region of WA.

Perennial grasses such as winter active phalaris cultivars and winter active Tall Fescues are likely to be very productive over winter supporting high stocking rates, extend the growing season and are persistent.

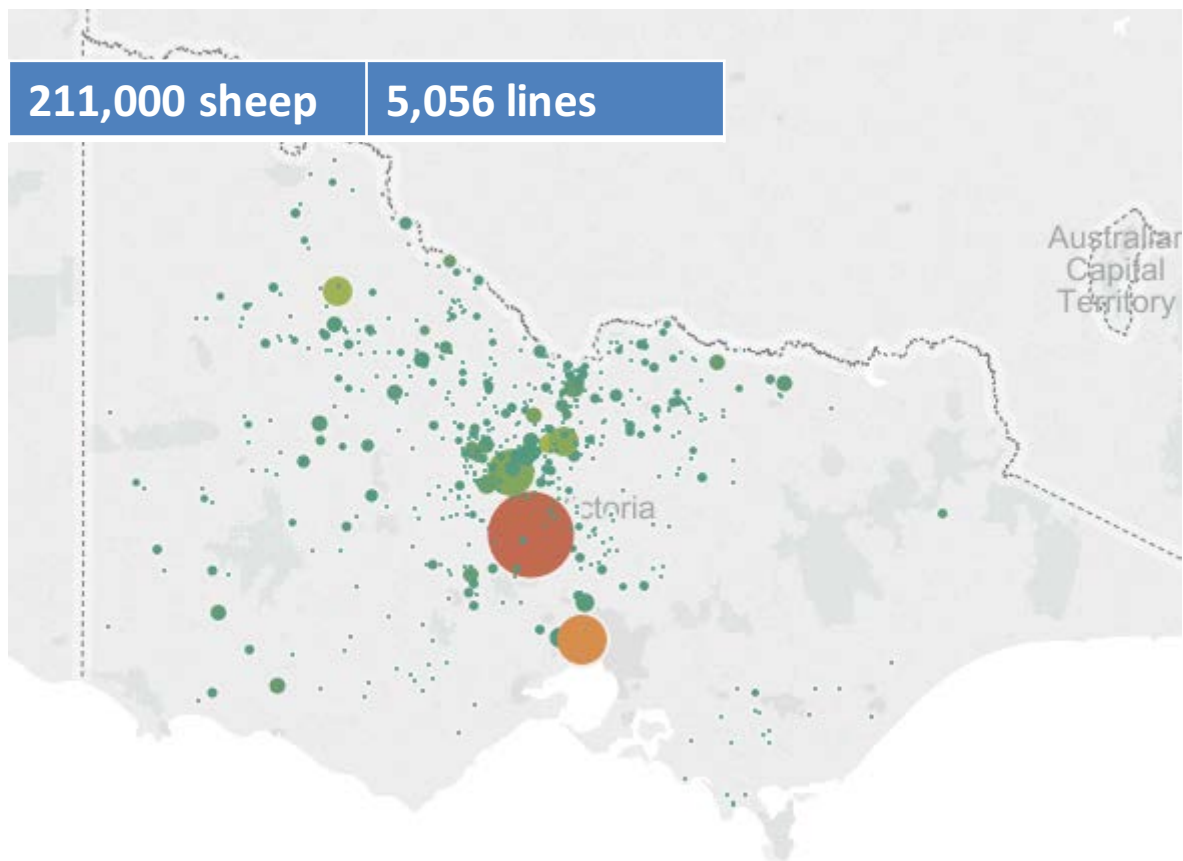
However, a significant extension program addressing perennial pasture establishment and sheep management may be required in this mainly cattle rearing region.

If the South West region takes on backgrounding, the lambs could be sourced from Great Southern store lamb producers. Freight costs to and from this region would not be large.

From my knowledge of this region, to encourage producers to engage in this enterprise is probably going to require ongoing training, forward contracts and perhaps even proof sites with pasture and stock run.

The development of such an enterprise based in this region would open the possibility of sourcing lambs from store lamb producers further inland where growing seasons are shorter. This could allow store lamb producers inland to lamb later and turn off a higher number of lambs per hectare, but still get paid for their store product at profitable levels.

Destination of lambs to Victorian producers from Bendigo saleyards



Eastern Riverina backgrounding

Description

Outline of typical backgrounding enterprise

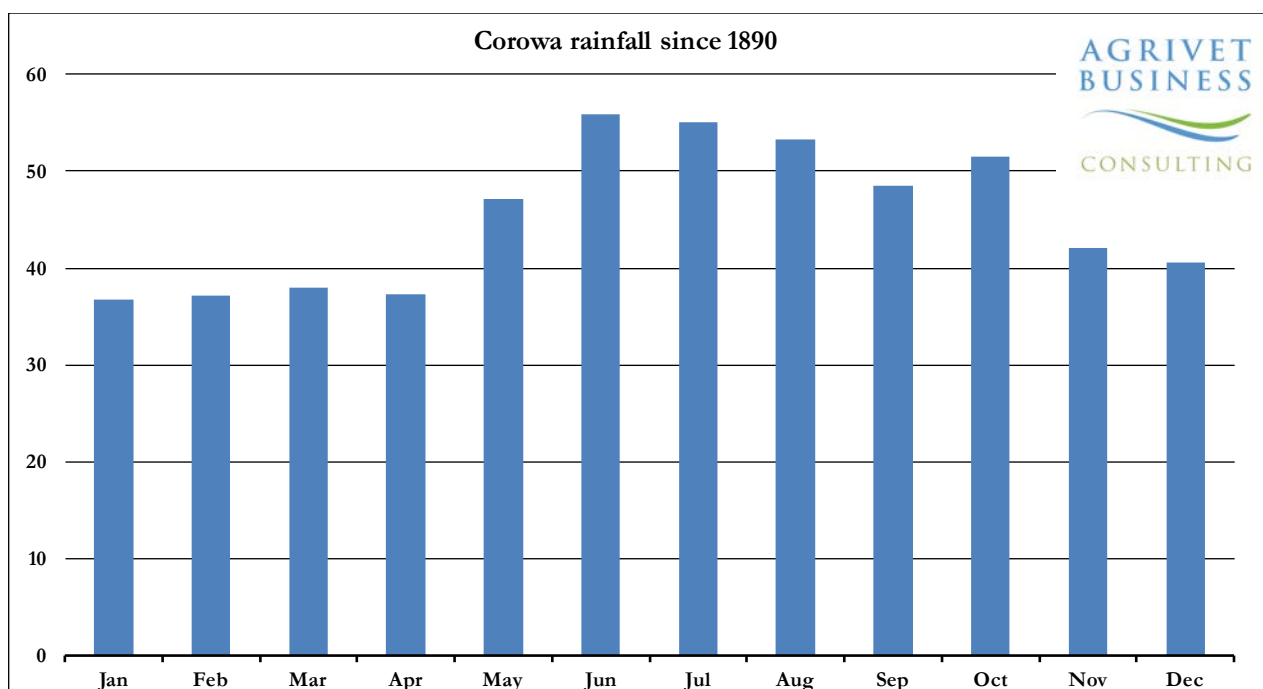
Generally, this area is defined loosely, as it encompasses the lucerne growing districts north of Bendigo, but more so either side of the Murray River with access to good soil types that support lucerne. Parts of North East Victoria also are part of these region.

There is a lot of variation of lamb backgrounding enterprises in the Eastern Riverina too. Like the High Rainfall zone, increasingly backgrounders are using grain to meet both backgrounding and finishing targets. Nevertheless, the presence of lucerne enables a low cost, high quality feed source to meet the lamb requirements when either backgrounding or on some farms, finishing.

Lambs that are home bred or purchased will be grazed on high quality pastures in the spring, but there is a wide spread of conditions, particularly when grass/clover pastures hay off towards the end of spring. Most of the farms use Merino genetics as a base, often joined to terminals, but not all.

But given that nearly 1 million lambs are estimated at going into the zone, a lot of lambs are purchased as stores for backgrounding and finishing. A number of these lambs are 2nd cross from the southern high rainfall zone. Stock agents contacted highlighted how many lambs were moved into this zone.

The Eastern Riverina is a loosely defined region, but encompasses farms in Northern Victoria that have lucerne as part of their pastures either side of the Murray River.



Nearly 1 million lambs are backgrounded and finished in this region.

With the lucerne in this region supplying high quality feed into late spring and early summer, lambs are backgrounded at good growth rates cheaply.

Some farms in this region are able to finish lambs in summer on irrigated lucerne.

One of the key reasons is the performance of the lambs on lucerne in the backgrounding phase.

Many of the pastures in this zone are phalaris and sub clover based with dry-land lucerne also in many paddocks. However, there is a wide range of pasture types in the Eastern Riverina. Some of the lucerne is also irrigated with lambs backgrounded and turned off on a continual basis. But this is the exception and the amount of the farm in lucerne and the quality of the lucerne varies considerably as does soil types and growing season. In general, the growing season is not as long as the High Rainfall Southern zone, but the lucerne effectively extends this well into summer depending on summer rainfall and soil types.

Thus, typically the season hays off in late November/early December, while lucerne will continue to grow over the summer period, provided summer rainfall is sufficient, or the soil type allows the lucerne to access good levels of subsoil moisture.

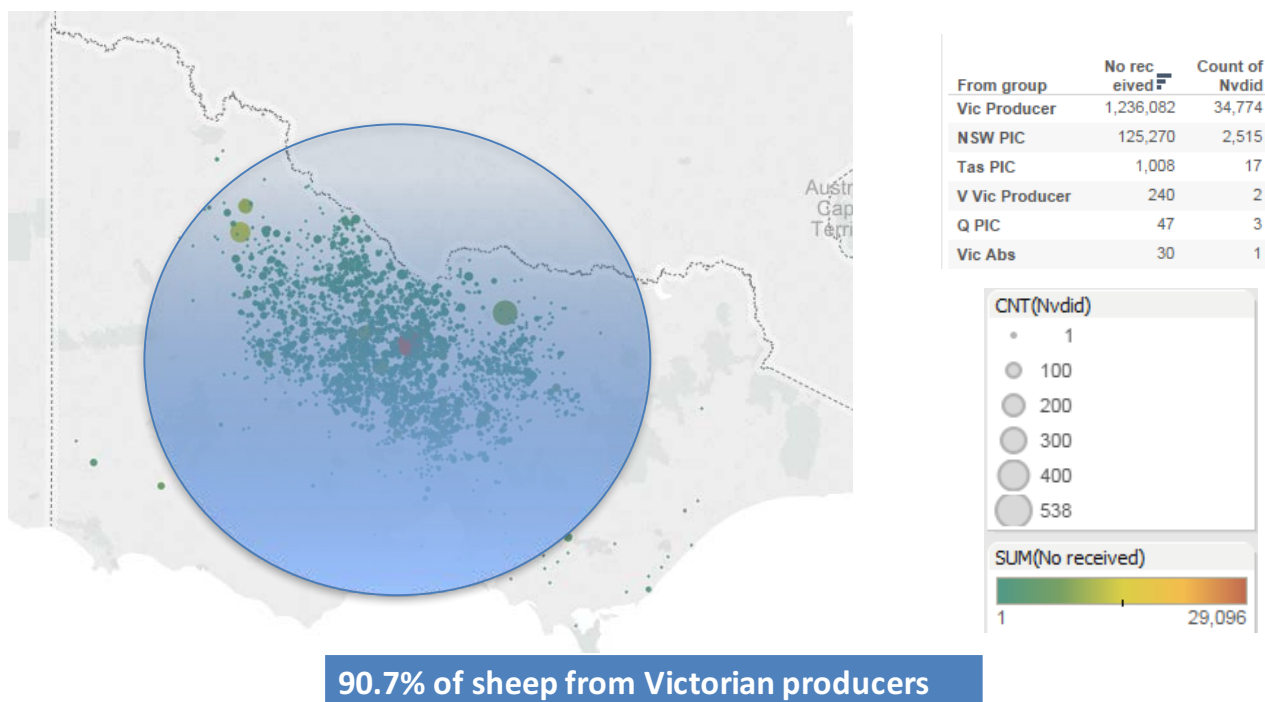
While the region's total rainfall is generally less than the High Rainfall zone, see graph of Corowa rainfall above on page 27, it is more evenly spread through the year, with a bit more falling in summer than Hamilton. This is conducive to better lucerne growth rates over summer. Given lower rainfall over winter, pastures aren't as prone to water logging and means that lucerne is more persistent given reasonable soil types. Note, there is a lot of variation of total rainfall in this region with some districts having lower and some higher rainfall than Corowa, the pattern is largely indicative of this region, but there are differences.

On summer pastures, which are predominantly dry from early December to late April, lucerne backgrounding can support about 100 g/hd/day growth or 3.0 kg/hd/month. Therefore, in approximate terms the backgrounding stage and weights have a similar timetable and value to lambs backgrounded in the High Rainfall zone.

On some farms, they are able to finish lambs on suitable lucerne paddocks, which can support growth rates of 200 g/hd/day, as established by CSIRO trials at Wagga Wagga. Of course, there is considerable variation in both the backgrounding and finishing growth rates, which results in a range of outcomes in practice.

More producers in the Eastern Riverina are putting in lamb feedlots according to a number of sources. The main reason for this is the reliability of delivering product to processors and supermarkets. As outlined previously in the High Rainfall zone, in the finishing phase, one might expect better than 200 g/hd/

Source of lambs to Bendigo saleyards



90.7% of sheep from Victorian producers

day growth rates at the finishing stage in a feedlot and about 200 g/hd/day or less on lucerne.

Source of lambs

As outlined previously, nearly 1 million lambs are backgrounded in this zone and the majority are sourced from on-farm, Bendigo saleyards and other minor yards closer to the zone. See figure on page 26 outlining where lambs go from Bendigo saleyards when going to Victorian producers. Most lambs are essentially sourced from either on farm from the High Rainfall southern zone, Bendigo yards or Wagga yards. See figure above on this page for source of Bendigo lambs.

Lambs sourced from Bendigo yards (mostly from the High Rainfall Zone), as well as home grown lambs are backgrounded and finished in this region.

Estimate of lamb numbers

As outlined previously, it is estimated that nearly 1 million lambs are backgrounded in this zone. Some are sourced from the home farm, while it appears that significant numbers are sourced from the High Rainfall zone as well.

Pasture types

Lucerne is a feature of many of the farms that engage in a backgrounding enterprise in this zone. Many farms also have phalaris and sub clover based pastures, which are also used to put weight on lambs when initially purchased, but once pastures hay off with the onset of summer, sufficient weight gains are unlikely. They are then moved to lucerne pastures.

Lamb finishing budget and sensitivity

Eastern Riverina zone

Client:- DAFWA

Comments:- 10-year real prices

Prepared By: Graham R. Lean BVSc, MAAAC

Date: 4-Sep-17

Store Period (Nov-Feb)	X Bred	
Lamb start weight (Nov)	28 kg	
Landed value of store lamb (\$/hd)	\$72	\$/hd
Days on crop	50 days	
Amount of feed eaten (kg/day)	0.0 kg/hd/day	<i>On crop</i>
Total feed eaten (kg)	0 kg	
Total cost of ration (\$)	\$0.00	per head
Final liveweight (kg)	38 kg	
LW Gain (g/day)	100 g/day	
Fodder crop cost/hd	\$0.00	<i>Share of crop costs</i>
Starting fleeceweight (kg)	1.0 kg	
End fleeceweight (kg)	1.5 kg	

Finishing Period Feb-March

Store lamb start weight (Feb)	38 kg	
Days on feed	43 days	
Amount of feed eaten (kg/day)	1.7 kg/day	
Growth rate on feed (g/hd/day)	280 g/hd/day	
Final liveweight (kg)	50 kg	
Final dressed weight (kg)	23 kg	
Dressed price (c/kg)	537 c/kg	
Final carcass value (\$)	\$124	per head
Total feed eaten (kg)	77 kg	
Total Cost of ration (\$)	\$21	per head
Starting fleeceweight (kg)	1.5 kg	
Final Greasy fleeceweight (kg)	1.9 kg	
Store lamb buy-in price (from above)	\$72	per head
Labour cost (\$/hd)	\$0.56	per head
Animal Health (\$/hd)	\$1.50	per head
Shearing cost (\$/hd)	\$0.00	per head
Crutching cost (\$/hd)	\$1.50	per head
Freight - Out (\$/hd)	\$2.00	per head
Death rate & shy feeders (%)	6%	
Total Costs (\$)	\$98.25	per head
Value of skin in April -June	\$9.63	per head
Total Income (\$) (skin, lamb)	\$123.66	per head
Profit \$/hd	\$25.42	per head
% return on investment	26%	per head
Market value of finishing ration	\$265	per tonne

For the Eastern Riverina, typical Merino X lambs result in a gross margin of \$26/lamb and a return on investment of 26% based on real 10 year average lamb and grain prices.

End destination

Because of their location, these lambs have a diverse range of endpoints. But the majority end up at Victorian abattoirs either destined for export or for domestic consumption. There appears to be no dominant destination for lambs backgrounded and finished in this zone.

Eastern Riverina backgrounding gross margins

See estimated gross margins for a typical operation in this zone. It assumed backgrounding on existing lucerne pastures takes place before a grain finishing phase. Assumptions are similar to the High Rainfall zone apart from lamb

Eastern Riverina	Lamb 20th percentile (462 c/kg)	Lamb 50th percentile (545 c/kg)	Lamb 80th percentile (608 c/kg)
Gross margin			
Grain 20th percentile (\$198/t)	\$29.10	\$35.49	\$31.49
Grain 50th percentile (\$252/t)	\$24.46	\$30.85	\$26.84
Grain 80th percentile (\$292/t)	\$21.36	\$27.75	\$23.74
Eastern Riverina	Lamb 20th percentile (462 c/kg)	Lamb 50th percentile (545 c/kg)	Lamb 80th percentile (608 c/kg)
Return on investment			
Grain 20th percentile (\$198/t)	37%	39%	29%
Grain 50th percentile (\$252/t)	29%	33%	24%
Grain 80th percentile (\$292/t)	25%	28%	21%

freight costs, and the grain ration mix and cost is assumed to be the same due to similar proximity to grain supplies as the High Rainfall zone.

This same comments for the High Rainfall zone gross margin applies to this gross margin calculation too. That is, the typical operation is likely to show better profitability due to better grain ration feed conversion than this gross margin assumes.

While freight costs are higher for the Eastern Riverina backgrounding enterprises, the cost of backgrounding is lower than the High Rainfall Zone.

Although freight costs are higher than typical producers in the High Rainfall zone, the lower costs of the backgrounding phase means that the gross margin is also at attractive levels. Further, for some producers with good lucerne stands and in some years where there is plenty of moisture during summer to drive lucerne growth rates, the lambs may be finished with minimal cost and thus high profitability.

This highlights probably why there has been a lot of growth in backgrounding operations in this region with the aim of taking advantage of it's lucerne pastures. There are many producers who finish the lambs on lucerne, but definite numbers are very difficult to estimate.

Seasonal variation and it's impact

The impact of poor seasons, and there have been quite a few of low rainfall seasons over recent years, has resulted in more feed lots being in put into place on farm if needed. The fact that this enterprise continues to grow in this region probably highlights the underlying profitability and the ability of producers to manage seasonal variation for the same reasons as outlined for the High Rainfall zone. Namely, buying store lambs more cheaply in poorer seasons when supply of store lambs is high and selling at higher out of season prices due to lack of supply later in the summer and autumn. Thus, the impact of poor seasonal conditions is a bit more complex than at first it might seem.

Note, lucerne growth rates over summer will be dependent on summer rainfall. In El Nino events, the impact of this normally wanes in summer, so summer rainfall is independent of an El Nino affecting spring rainfall. While lack of spring rainfall may impact on weights from home grown lambs and purchased stores, summer lucerne growth rates could be expected to be long term average and hence lamb growth rates would also be expected to be about long term average over summer.

Comparison to WA lucerne growing zones

There are currently few regions out of the intensive dairying areas of WA that grow dryland lucerne similarly to that undertaken in the Eastern Riverina.

That has not always been the case. Lucerne used to be grown quite extensively on the southern sandplain, but this land use has not been undertaken since introduced aphids wiped out stands in the late 1970s.

Although aphid resistant varieties now exist with better growth characteristics than pre-aphid varieties (mainly Hunter River), lucerne has not been resown substantially on the southern sand plain of WA since it was wiped out 40 years ago.

The main reason for this is the low returns from livestock in comparison to better returns from cereal and canola rotations according to consultants in WA. Livestock profitability recently has lifted and if gross margins of about \$25/lamb could be achieved, this might appear to be competitive with crop in this zone, given the number that could be run on lucerne over summer.

However, this gross margin would be considerably eroded by freight costs to and from the southern sand plain all other things being equal. There isn't a half-way point like Bendigo saleyards between the High Rainfall zone and the Eastern Riverina to "share" in the cost of transport between southern districts

The southern sand plain is an obvious match for the Eastern Riverina with its ability to grow lucerne. However, high freight costs and the changeover to heavy cropping programs make lamb backgrounding problematic.

of Victoria to the Eastern Riverina. Lambs are transported long distances both to and from the Eastern Riverina, but usually when there is a good margin to do so. But usually the freight component is not too large.

The choice appears to be limited for the southern sand plain. While the western edge of it is closer to the Great Southern and Narrikup, the majority of potential farms would have high freight costs built in, likely to be cost up to \$10/head or possibly more.

Wimmera backgrounding

Description

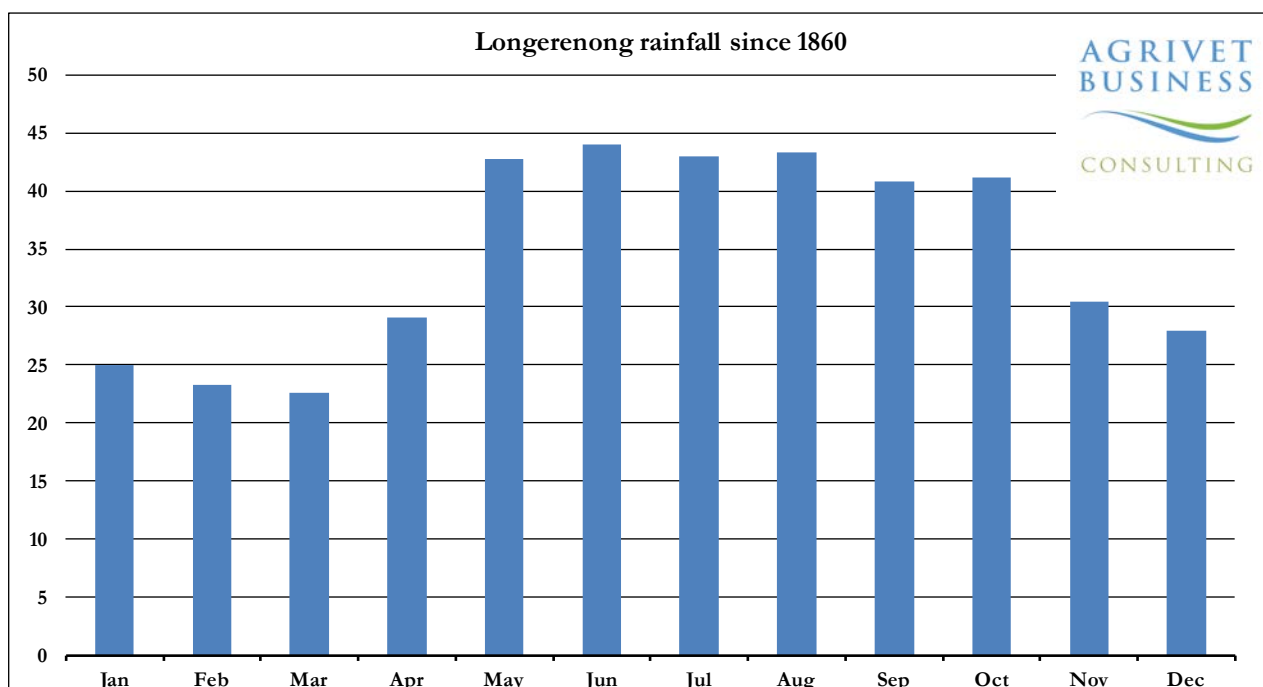
Outline of typical backgrounding enterprise

The Wimmera region has a more winter dominant rainfall distribution as well as low rainfall, making it suitable for cropping. The follow chart on this page shows monthly rainfall at Longerenong, which is close to Horsham, and totals 426 mm over the year. The main crops grown in this region are cereals (predominantly wheat), Canola and Faba Beans as well as lentils as an emerging crop. A very small area of lupins are grown in this region. Lupins are mainly grown in the Victoria and South Australian mallee and there have been less grown as each year goes by, due to replacement with Canola in recent years.

Many of the lamb operations in the Wimmera, typically produce their own lambs, or buy them from the High Rainfall zone as stores and put them on cereal or bean stubbles. In parts of the West Wimmera, where there is irrigation, backgrounding and finishing of a lot of lambs can be undertaken. While there is a lot of lucerne grown in these circles, it is generally grown primarily for seed. This conflicts with grazing the lucerne over the summer and early autumn period to background and finish lambs, as the lucerne seed crops need to be locked up and kept ungrazed from the spring to autumn. Even on these farms, lambs are generally backgrounded on stubbles and then finished if necessary in a feedlot.

Lambs are also backgrounded on stubble, in particular Faba Bean stubble, in the Victorian Wimmera. This region is minor in comparison the High Rainfall Zone and Eastern Riverina.

Some lambs are also backgrounded and finished on irrigation in the West Wimmera.



Cereal and Canola stubbles do not provide sufficient weights gains to background lambs successfully.

More commonly, a background period occurs on cereal or Faba Bean (bean) stubbles and the lambs are finished either on bean stubbles or in a feedlot. Good backgrounding type growth rates can be achieved on bean stubbles or better. Cereal stubbles usually don't provide a very high level of nutrition for long, particularly with increasingly cleaner harvests due to improved headers.

Despite the attractiveness of backgrounding in the Wimmera, the actual area of suitable bean stubbles is not that large, and while the region used to be a sheep/wheat zone, many producers focus mainly on crop.

However, bean stubbles usually finish quite a few lambs in the backgrounding phase, so they are very useful for putting quite a bit of weight on lambs. But many bigger lamb backgrounders in the Wimmera now feedlot due to the variability of the finishing phase with bean stubbles. And there is enough money in finishing of the lambs to use grain to do it more consistently and obtain good drafts of lambs hitting the middle of the grid at one time.

Lamb finishing budget and sensitivity

Wimmera zone

Client:- DAFWA

Comments:- 10-year real prices

Prepared By: Graham R. Lean BVSc, MAAAC

Date: 4-Sep-17

Store Period (Nov-Feb)	X Bred	
Lamb start weight (Nov)	28 kg	
Landed value of store lamb (\$/hd)	\$72 \$/hd	
Days on crop	100 days	
Amount of feed eaten (kg/day)	0.0 kg/hd/day	On crop
Total feed eaten (kg)	0 kg	
Total cost of ration (\$)	\$0.00 per head	
Final liveweight (kg)	43 kg	
LW Gain (g/day)	150 g/day	
Fodder crop cost/hd	\$0.00	Share of crop costs
Starting fleeceweight (kg)	1.0 kg	
End fleeceweight (kg)	1.9 kg	

Finishing Period Feb-March

Store lamb start weight (Feb)	43 kg	
Days on feed	28 days	
Amount of feed eaten (kg/day)	1.7 kg/day	
Growth rate on feed (g/hd/day)	280 g/hd/day	
Final liveweight (kg)	51 kg	
Final dressed weight (kg)	23 kg	
Dressed price (c/kg)	537 c/kg	
Final carcass value (\$)	\$125 per head	
Total feed eaten (kg)	52 kg	
Total Cost of ration (\$)	\$13 per head	
Starting fleeceweight (kg)	1.9 kg	
Final Greasy fleeceweight (kg)	2.2 kg	
Store lamb buy-in price (from above)	\$72 per head	\$55,000/25,00
Labour cost (\$/hd)	\$0.77 per head	
Animal Health (\$/hd)	\$1.50 per head	
Shearing cost (\$/hd)	\$0.00 per head	
Crutching cost (\$/hd)	\$1.50 per head	
Freight - Out (\$/hd)	\$2.00 per head	
Death rate & shy feeders (%)	6%	
Total Costs (\$)	\$91.40 per head	
Value of skin in April -June	\$9.63 per head	
Total Income (\$) (skin, lamb)	\$125.52 per head	
Profit \$/hd	\$34.12 per head	
% return on investment	37% per head	
Market value of finishing ration	\$260 per tonne	

The Wimmera backgrounding gross margin is very attractive.

Wimmera Gross margin	Lamb 20th percentile (462 c/kg)	Lamb 50th percentile (545 c/kg)	Lamb 80th percentile (608 c/kg)
Grain 20th percentile (\$187/t)	\$35.68	\$42.36	\$38.57
Grain 50th percentile (\$247/t)	\$32.52	\$39.25	\$35.46
Grain 80th percentile (\$287/t)	\$30.50	\$37.18	\$33.39
Wimmera Return on investment	Lamb 20th percentile (462 c/kg)	Lamb 50th percentile (545 c/kg)	Lamb 80th percentile (608 c/kg)
Grain 20th percentile (\$187/t)	49%	50%	38%
Grain 50th percentile (\$247/t)	43%	45%	34%
Grain 80th percentile (\$287/t)	39%	41%	31%

Normally the season will end and hay off in later October/early November, leaving very little time for pastures to put some weight on lambs before pasture quality declines. Pasture quality is usually poor and does not have the quality to add weight to lambs late in the season.

On another note, one may wonder why there isn't more backgrounding and finishing undertaken in the Wimmera? Probably the answer lies in the history of producers in this region concentrating on crop production and moving out of livestock as a result. Further, stocking rates and suitable grazing areas on bean stubbles are limited, so therefore the numbers of lambs that could be backgrounded in this region is somewhat limited. However, based on current numbers, more lambs could be backgrounded in this region, but there is a lot of uncertainty about how many more could be backgrounded.

The Wimmera backgrounding gross margin is underpinned by the excellent performance of lambs on Faba Bean stubbles.

Source of lambs

While some lambs are homegrown, as far as can be determined the majority of lambs are sourced from southern Victoria, which is relatively close to the Wimmera. Horsham is about 130 km north of Hamilton. But lambs are also accessed across the border from the SE of South Australia, as well as southern New South Wales.

Estimate of lamb numbers

Given that there are estimated to be 4 million lambs backgrounded in Victoria, with nearly 3 million backgrounded in the High Rainfall zone and nearly 1 million backgrounded in the Eastern Riverina, in reality the Wimmera gets lost in the rounding. There is estimated to be over 100,000 lambs in total.

Stubble types

Predominantly, lambs are backgrounded on bean stubbles. They perform very well on these, but are not always present in sufficient quantity to finish the lambs reliably.

End destination

Many lambs from this region end up going export through the JBS plant at Bordertown and TFI at Murray Bridge. There are also lambs that go to Victorian plants for supermarkets and export.

Wimmera backgrounding gross margins

The following gross margin calculation assumes that the backgrounding phase on bean stubbles results in a higher average weight and thus leads to a shortening of the finishing phase and a saving in cost of feeding the grain ration. Hence that saving converts into a high return. In practice, it's likely that a proportion of lambs would be finished by the end of the "backgrounding" period and the balance would be finished for a normal period in the feedlot. The end result is the same, but with a slightly different execution. It is also likely that the cost of grain will be less than High Rainfall and Eastern Riverina backgrounders pay due to lack of freight cost and a modest reduction of \$5/tonne has been taken off grain prices to reflect a likely home advantage to use grain at a lower price than either the high rainfall zone or the Eastern Wheatbelt could obtain, but grain is produced in areas of both regions.

How good are bean stubbles? Generally, they enable lambs to gain around 250 g/hd/day or better (depending on the amount of beans in the stubble) for about 6 weeks at 7.5 lambs/ha. Whilst there is considerable variation to this performance with trials (very limited) and producer experience showing better or poorer results, this is a "best guess" level of performance. Note, in this case, I have budgeted on even lower growth rates of 150 g/hd/day, as that is the published performance over longer periods on Faba bean stubbles. Nevertheless, this rate is about twice growth rate levels of lambs expected on cereal stubbles.

Seasonal variation and its impact

In comparison to the High Rainfall zone and the Eastern Riverina, producers are more likely not to trade in a poor season. In a poor season, there is a little pasture, if any, for backgrounding lambs for even a short time, crop yields are poor so usually grain is high priced and best sold; not value added by putting into a lamb. Stubbles are usually poorer too, so stock don't do so well.

In the past, a bad season might see crops not harvested and sheep purchased to put on standing crops. This does not tend to occur in recent poor seasons as the crop agronomy and harvesting technology has improved to a point where normally it is still profitable to harvest.

In short, seasonal variation is quite significant in this region in contrast to the High Rainfall zone and the Eastern Riverina.

Comparison to WA Wheatbelt

The obvious comparison for the Wimmera in WA is the Wheatbelt. That both areas have similar rainfall patterns and that land use is dominated by crop is essentially the end of the comparison.

The cropping rotations of the Wheatbelt of WA is dominated by cereal and Canola, which means there are not attractive back-grounding options. Further, like the Wimmera there are many producers not interested in diversifying into a sheep operation.

The soil types of WA are not conducive to growing Faba Beans with resultant yields usually disappointing. Further, lupins have a place in the northern Wheatbelt, but have still yet to have a large impact on land use in the Central, Southern and Eastern Wheatbelt, which means the dominant land use is for cereal grains and Canola. Neither provide lambs with much backgrounding, let alone finishing.

There is potential for backgrounding and finishing on home grown grain in the Wheatbelt at a lower cost than could be achieved in South West WA. This is likely to be the main way producers could undertake this enterprise profitably, but would need to be near store lambs and abattoirs so freight costs are controlled.

Unless there are large gains in Faba Bean and Lupin breeding, one struggles to see how much potential for these regions to background lambs in WA.

In comparison to the Wimmera, the WA wheatbelt has few Faba Bean stubbles and little lupin stubble as well to background lambs competitively.

As an aside, given the better Wimmera gross margins, one might wonder why more lamb backgrounding is not undertaken in the Wimmera. Ultimately this revolves around the view by many Wimmera farmers that they are primarily croppers and backgrounding lambs is a distraction to optimise their main enterprise. There are some exceptions, with some Wimmera grain operations backgrounding large numbers of lambs. Further, the feed resource while of

high quality, is not that large due to the area sown to Faba Beans and their stocking rates over summer.

Potential for WA

Production system comparison

The South West region of WA is nearest to possibly offering attractive backgrounding opportunities in WA, as there are some similarities to the Victorian High Rainfall zone.

Our calculations agree with John Young's findings that backgrounding that is solely dependent on cereal grain is not likely to be profitable enough to be attractive to producers.

For the South West region of WA to successfully background lambs, perennial pastures establishment and maintenance would need to be demonstrated and perhaps sheep silage systems as well as summer fodder crops.

Production systems have been compared previously, but as an overview it would seem that there is some potential for the high rainfall South West region to background lambs in WA. This is something that could grow the lamb industry significantly in WA due to better supply management through the year but also making the industry much bigger in total and more profitable.

There may be some potential for the southern sandplain, but there are real obstacles for this to become a realistic option to background lambs profitably as outlined previously. Freight and current land use is likely to be significant obstacles.

The Wheatbelt has significant obstacles to overcome, as management is currently practised, to become a serious lamb backgrounding region due to the predominance of cereal and Canola crops rotations.

One of the key drivers of the positive gross margins for typical Victorian background operations is the availability of cheap feed resources that put a reasonable amount of weight on store lambs prior to the finishing phase. Thus, store lambs are generally not backgrounded on cereal stubbles in Victoria as the weight gains are insufficient to prepare them for feedlot entry or an alternative finishing system. Thus, it would be expected that the gross margin of a typical backgrounding enterprise in Victoria would also be negative or low if the backgrounding was undertaken on cereal, as John Young found for WA.

While there are some backgrounders who use grain, most do not. However, it would be true to say that more backgrounders are starting to use grain in the backgrounding phase as pastures hay off and quality declines, to ensure growth rates are kept to target, but this occurs normally for short periods. The introduction of grain also prepares the lamb's rumen for a high cereal grain based diet in the finishing phase if grain is heavily used in this phase.

One of the key areas for lamb backgrounding is that the Victorian southern high rainfall zone experiences a long and large spring flush. For example, at Hamilton the average season breaks in early April and finishes off early in January. It is this cheap source of high quality feed that is present into early January that can background the lambs at reasonable growth rates as demonstrated by the GrassGro output.

On the other hand, the Eastern Riverina has lucerne providing cheap feed in late spring and summer. This lucerne is normally sown as part of the pasture mix in this region and not sown as a specialist lamb backgrounding pasture, hence there is no additional cost attributed to it.

The South West of WA would appear to be the best bet to replicate this type of lamb backgrounding enterprise. Some of the characteristics that are similar and some areas that might help the development of this region for lamb backgrounding are: -

***Raphno hybrid
brassica might be
very attractive due
to it's high water
efficiency***

- ❖ Persistent and productive perennial grass pastures. Sub clovers are already established in these areas successfully.
 - Phalaris cultivars such as Holfast GT and Landmaster are winter active and persistent
 - Winter active Tall Fescues are also very winter active and persistent such as Resolute and Fraydo.

- ❖ The possibility of sowing summer fodder crops might be investigated. With current species and cultivars, the prospects might not be too good, but with Raphno Hybrid brassica to be released in spring 2018, it's high water efficiency, may provide this region with a high quality and productive summer fodder crop. PGG Wrightsons currently have trials underway with this cultivar in south west WA.

- ❖ Sheep based silage systems centred around early season cutting to enable consistent high quality, relatively cheaper, high quality supplements for summer and autumn.

***Given better sheep
enterprise gross
margins than crop
for much of WA, it
might be profitable
to sow standing
crops to back-
ground/finish
lambs over summer***

Pricing comparison

Current crop gross margins are actually poor in comparison to livestock. And looking out further, the gross margins from backgrounding and finishing lambs are attractive and likely to be higher than crop.

However, to take advantage of the opportunity improved livestock profitability offers, will require further capital investment and a big change in farm management.

It might be possible to sow standing crops in the wheatbelt or southern sand plain to better feed lambs over summer and to finish them, but this is very different thinking for the current farmer generation.

Forward contract comparison

Without forward contracts in Victoria, farmers are adamant that out of season lamb production would not occur.

A number of producers and agents contacted in Victoria were adamant that without forward contracts lamb backgrounding would not have grown at the speed or extent it has in Victoria.

In my discussions with clients about feeding lambs, I always advise to forward contract a good proportion of the lamb drop. Quite simply, if the end price is known, the feed ration price is known, the only unknown is how much they are going to pay for the lamb as a store. It is then reasonably straightforward to lock into a profitable outcome.

What does WA need to do?

A few essential steps need to take place to develop more fully the potential for the lamb industry. These steps are: -

To develop out of season lamb production WA needs to introduce forward contracts, establish that perennial pastures can be maintained in the South West region and that there are cheap systems to feed lambs over summer

- ❖ Introduce a range of forward contracts to cover the out of season lamb supply that doesn't currently exist.
- ❖ Investigate the feasibility of longer season perennial pasture for south west WA, particularly using some of the more productive and persistent cultivars such as Holdfast GT and Landmaster phalaris as well as Fraydo and Resolute winter active Mediterranean sourced Tall Fescues.
- ❖ Investigate a systems approach for a background lamb enterprise for the south west such as: -
 - silage for sheep
 - standing crops
 - feedlots
 - worm and fly management packages
 - investing in practical, cost effective sheep infrastructure
 - and efficient and profitable store lamb production in the Great Southern particularly
- ❖ Investigate the feasibility of standing crops for backgrounding lambs in the wheatbelt or backgrounding or feed lotting lambs with home grown grain
- ❖ Investigate the feasibility of lucerne on the sand plain for backgrounding lambs

Other areas to investigate is the feasibility of back-grounding lambs on lucern pastures on the Southern Sand Plain and the potential of standing crops to feed lambs during the summer in the Wheatbelt.

- but this is of lower priority due to the high transport costs

Appendix 1 - Gross Margin Assumptions

High rainfall Gross Margins

Some more detailed assumptions behind the High Rainfall zone Gross Margins: -

- ❖ The lamb is assumed to be born in July and sold as a store in November at 28 kg.
- ❖ It is a Merino 1st cross from a terminal sire.
- ❖ For the first 50 days it is backgrounded on green grass/early maturing dry grass into early January, when it is then put onto a summer fodder crop, such as a brassica crop.
- ❖ The fodder crop is costed at \$250/ha, and runs 25 lamb/ha over summer and autumn. Thus, it is costed at nearly 7 c/day, which is based on grazing it for 150 days total, of which these lambs graze it for 50 days.
- ❖ Thus, they gain 10 kg, or 100 g/hd/day over 100 days, which is considered conservative gains. In many cases, they would continue to graze the summer fodder crop, but this is highly dependent on summer rain and residual soil moisture levels from the spring.
- ❖ They then are fed a grain ration for 43 days, a mix of 55% barley, 25% lupins and 20% hay. The feed conversion ratio is 6.1:1 as fed. They gain 280 g/hd/day for 43 days.
- ❖ Labour costs are taken from actual larger lamb feedlot operations. These operations are well set up with large efficient machinery and background and feed many thousands of lambs. Although this scale is not typical of many operations, many typical operations have low real labour costs due to existing farm staff combining lamb feeding operations in with other farm operations, and hence the real cost of the lamb backgrounding and feeding operation is low. However, given that labour does need to be costed, it was done on the basis where labour is hired and it was possible to clearly assess the cost. But there will be a lot of variation in labour cost of lamb backgrounding operations.

- ❖ It was assumed that the lambs were crutched but not shorn to simplify the gross margin. In many cases they would be shorn, which is unlikely to change the overall gross margin due to wool income covering the cost of shearing in many cases.
- ❖ Freight costs will vary a lot, but in this zone abattoirs and saleyards are relatively close.
- ❖ Selling costs are minimal with only MLA levies taken out, as over recent years the majority of lambs are sold direct, and do not necessarily have an agent cost.

Eastern Riverina Gross Margins

Some more detailed assumptions behind the Eastern Riverina zone Gross Margins: -

- ❖ The lamb is assumed to be born in June and sold as a store in October at 28 kg.
- ❖ It is a Merino 1st cross from a terminal sire.
- ❖ For the first 50 days lambs are backgrounded on green grass/early maturing dry grass into early December, when they are moved onto lucerne, which at this time of year is still actively growing.
- ❖ The lucerne is part of many pastures in this zone, although there is a lot of variation in individual farms. Most are dryland, but irrigated lucerne is also used to background and fatten lambs on some farms.
- ❖ Thus, they gain 10 kg, or 100 g/hd/day over 100 days, which again is considered conservative. In many cases, they would continue to graze the lucerne till they reach 50 kg, but this is also highly dependent on summer rain and residual soil moisture levels from the spring.
- ❖ They then assumed to be fed a grain ration for 43 days, a mix of 55% barley, 25% lupins and 20% hay. The feed conversion ratio is 6.1:1 as fed. They gain 280 g/hd/day for 43 days.
- ❖ Labour costs are similar to the high rainfall zone.
- ❖ It was assumed that the lambs were crutched but not shorn to simplify the gross margin. In many cases they would be shorn, which is unlikely to change the overall gross margin due to wool income covering the cost of shearing in many cases.

- ❖ Freight costs are higher than the High Rainfall zone, as they will tend to be purchased from Bendigo region, the High Rainfall zone or even further away and then must be transported to abattoirs or saleyards.
- ❖ Again, selling costs are minimal with only MLA levies taken out, as the majority of lambs are sold direct, and do not necessarily have an agent cost.

Wimmera Gross Margins

Some more detailed assumptions behind the Wimmera zone Gross Margins: -

- ❖ The lamb is assumed to be born in June and sold as a store in October at 28 kg.
- ❖ It is a Merino 1st cross from a terminal sire.
- ❖ For the first 100 days lambs are backgrounded on Faba Bean stubble.
- ❖ Faba Bean stubbles are present on many farms in the Wimmera as part of the cropping rotation.
- ❖ Thus, they gain 15 kg, or 150 g/hd/day over 100 days, which is considered conservative. In many cases, they would continue to graze the bean stubble till they reach 50 kg, but this is also highly dependent on Faba Bean yields and the amount of grain left behind after harvest, and the proportion of bean stubble the farm.
- ❖ They then assumed to be fed a grain ration for 28 days, a mix of 55% barley, 25% lupins and 20% hay. The feed conversion ratio is 6.1:1 as fed. They gain 280 g/hd/day for 28 days. The grain is assumed to cost less than in the High Rainfall zone and the Eastern Riverina zone due to being sourced all on farm, versus being bought in.
- ❖ Labour costs are similar to the high rainfall zone.
- ❖ It was assumed that the lambs were crutched but not shorn to simplify the gross margin. In many cases they would be shorn, which is unlikely to change the overall gross margin due to wool income covering the cost of shearing in many cases.
- ❖ Freight costs are higher than the High Rainfall zone, as they will tend to be purchased further away, then must be transported to abattoirs or saleyards.

- ❖ Again, selling costs are minimal with only MLA levies taken out, as the majority of lambs are sold direct, and do not necessarily have an agent cost.