final report

Project code: E.PDS.1410

Prepared by: Bindi Hunter
Agriculture Victoria

Andrew Whale
Livestock Logic

Date published: June 2019

PUBLISHED BY
Meat and Livestock Australia Limited
Locked Bag 1961
NORTH SYDNEY NSW 2059

Autumn Saving of Pastures Demonstration

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

Abstract

The aim of this demonstration was to explore the costs and benefits of autumn saving. Autumn saving involves locking up paddocks after the autumn break until Feed On Offer (FOO) requirements are sufficient to maintain enough feed to get through until spring, when pasture growth increases dramatically. The demonstration was undertaken over three years with the Glenthompson-Dunkeld Best Wool/Best Lamb group in south west Victoria.

The demonstration compared two systems;

- The **deferred mob** were kept in containment and fed a grain/hay ration meeting their energy, protein and fibre requitements and continued in containment until FOO was adequate to meet the target for twin bearing ewes at lambing (approximately 1400kgDM/ha).
- The **set stocked mob** grazed according to the producers' usual management style and split across the treatment paddocks just prior to lambing.

The average time in containment to enable adequate FOO accumulation to meet the target 1400kgDM/ha was 33 days, costing an average of $5.17/ ewe. The extra FOO grown prior to lambing averaged 850kg DM/ha, at a cost of $48/t.

Animal performance and subsequent profitability varied considerably over the three years. However, the large variation in animal performance and subsequent profit/ewe was more of a reflection on management practices than on the autumn saving concept and led to some useful insights for managing ewes in containment.

Autumn saving was demonstrated to have clear benefits for cost effectively growing dry matter and ensuring FOO targets for twin-bearing ewes are met. Containment feeding after the break in wet condition and subsequently managing ewe condition in containment proved challenging in the third year of the demonstration.

An evaluation with group members showed improvements in knowledge, attitude, skills, aspiration and adoption (KASAA) of all parameters measured. These included knowledge (range between 23% increase to 57% increase), attitude (range between 11%increase to 30% increase), skills (range between 21% increase to 43% increase), aspirations (range between 19% increase to 37% increase) and adoption (range between 22% increase to 38% increase).

Executive summary

The practice of autumn saving has been adopted by some producers in southwest Victoria. It involves locking up paddocks after the autumn break until Feed On Offer (FOO) requirements are sufficient to maintain enough feed to get through until spring, when pasture growth increases dramatically.

Creating this feed wedge after the autumn break requires increased levels of supplementary feed while stock are kept either in containment or on sacrifice paddocks. This comes at a significant expense, as six weeks supplementary feed for ewes can cost around $6-12/head, depending on level of supplementation and fodder costs.

The Glenthompson-Dunkeld BestWool/BestLamb group, co-ordinated by Andrew Whale, undertook a three-year Enhanced Producer Demonstration Site (EPDS) project run with Agriculture Victoria and co-funded by Meat and Livestock Australia (MLA) to further examine the practice of autumn saving.

Immediately post scanning, a mob of twin bearing ewes was randomly and equally split, into a **deferred** mob (implementing autumn saving) and a **set stocked** mob and were allocated a portion of farm with similar area, terrain, soils, pasture species, and soil fertility.

- The **deferred mob** were kept in containment and fed a grain/hay ration meeting their energy, protein and fibre requitements and continued in containment until FOO was adequate to meet the target for twin bearing ewes at lambing (approximately 1400kgDM/ha). At that point, the ewes were released on to paddocks and were set stocked over lambing.
- The set stocked mob grazed according to the producers' usual management style and split across the treatment paddocks just prior to lambing.

FOO and feed quality were measured monthly and ewe condition was measured at regular intervals. The demonstration measured and compared lambing percentage, lamb weight and ewe condition score and calculated profit margins for the two treatments each year.

The deferred mob spent an average of 33 days in containment to enable adequate FOO accumulation to meet the target 1400kgDM/ha. The cost of feeding sheep in containment averaged $5.17/ ewe over the three years. In 2017 and 2018 the FOO at lambing exceeded targets and as a result, the ewes could have been removed from containment earlier which would have reduced the average days in containment and average cost of feeding.

The extra FOO grown prior to lambing averaged 850kg DM/ha, and an extra 27.7tDM each year over the deferred paddocks. This extra feed cost $48/t, calculated using the costs of feeding ewes in containment. This compares favourably to using urea to grow extra feed, which was estimated at $100/t DM; approximately twice the cost.

Animal performance varied considerably over the three years, and was negatively affected by management issues, such as condition score prior to entering containment, transitioning into containment and feeding in wet conditions (which led to poor feed utilisation).

Across the three years, lambing percentage ranged from +7% to -14% in the deferred mob compared to the set stocked mob. Lamb weight in September ranged from 2.1 kg heavier to 1.8 kg lighter in the deferred mob and lamb production per ewe ranged from +5.5kg to – 4 kg per ewe in the deferred mob compared to the set stocked mob.

Partial profit varied according to feed costs, lamb prices and animal performance each year. The difference in income between the treatments ranged from $8.99/ewe higher in the deferred mob (2016) to $18.54 higher in the set stocked mob (2018).

The large variation in animal performance and subsequent profit/ewe was more of a reflection on management practices than on the autumn saving concept and led to some useful insights for managing ewes in containment. These include:

- Managing ewes in containment after the autumn break is challenging due to rain.
- Feeding on the ground reduces utilisation, wastes money and adversely affects ewes.
- It is difficult to maintain or increase condition in containment.
- It is extremely important to have ewes in a good condition score profile before they head into confinement (>CS3.0)

Three field days and one workshop were held for producers over the three years of the demonstration. Sixty-one percent of attendees indicated that they would adopt aspects of autumn saving or adapt their stock containment areas and management based on demonstration findings, 30% indicated they were unsure if they would make changes and 9% indicated that they would not adopt autumn saving practices.

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1 Background

1.1 The Glenthompson/ Dunkeld BestWool/BestLamb group

1.2 Autumn saving

The Glenthompson/ Dunkeld BestWool/BestLamb (BWBL) group is made up of forty-three members, based east of Hamilton in southwest Victoria. Collectively, the group manage around 280,000 sheep and 10,000 head of cattle over an area of approximately 63,900 hectares.

This is one of the oldest BWBL groups having established around 1998. The group is predominantly interested in improving their livestock business, focusing largely on their sheep enterprises. Current group members are predominantly in the 25-40 age bracket and are fairly financially motivated and interested in ways they can adjust their management to achieve better financial results for their business. Many are running quite high stocking rates relative to the district average.

The problem for most producers running high stocking rate enterprises is achieving optimal pasture levels for ewes to lamb down as early in the season (winter/spring) as possible to maximize pasture utilization in the spring and therefore maximize lamb liveweight turned off per hectare.

The practice of autumn saving has been adopted by some producers in southwest Victoria. It involves locking up paddocks after the autumn break until Feed On Offer (FOO) requirements are sufficient to maintain enough feed to get through until spring, when pasture growth increases dramatically. Some producers in the south west implement autumn saving annually, others use containment feeding in dry seasons or when the break is late and many do not autumn save at all, instead feeding in paddocks.

The challenge with trying to create a feed wedge after the autumn break, is that it requires increased levels of supplementary feed while stock are kept in either confinement or on sacrifice paddocks. This comes at a significant expense, as six weeks supplementary feed for ewes can cost around $6-12/head, depending on level of supplementation and fodder costs.

The groups' interest in hosting the demonstration was to measure and show the outcomes of hitting pasture FOO targets heading into winter and finding out whether the benefits outweighed the extra cost of supplementary feed.

The project was primarily aimed at improving on farm profitability but depending on the season, there are also huge environmental advantages for removing stock from the majority of the farm once ground cover levels get below trigger points, to reduce top soil loss through erosion.

2 Project objectives

The overall aim of the project was to demonstrate autumn saving and measure the benefits over a range of different years.

The specific objectives were to:

1. Demonstrate the increased productivity that results from meeting pasture production levels for ewes through autumn saving.

2. Generate economic data on the relative profitability of autumn saving (animals withheld from pasture in autumn until FOO target is met) versus normal practice (strategic rotationally grazed, low input, 2-3 paddocks per mob) for the district.
3. Increase the knowledge and skills and adoption of autumn saving.

3 Methodology

3.1 General methodology

The demonstration was run on different host farms in 2016, 2017 and 2018, following a similar methodology.

Immediately after scanning, twin-bearing ewes were split randomly into a **set stocked (control)** mob and a **deferred (treatment)** mob.

- The **set stocked mob** grazed according to the producers' usual management style from scanning until just prior to lambing, when they were split across the treatment paddocks. The set stocked mob was supplementary fed in 2016 and 2018, based on paddock Feed On Offer (FOO) and feed tests, however this was not required in 2017.
- The **deferred mob** were kept in containment and fed a grain/hay ration meeting their energy, protein and fibre requitements. The deferred mob continued in containment until FOO was adequate to meet the target for twin bearing ewes at lambing of approximately 1400kgDM/ha. At that point, the ewes were released on to paddocks and were set stocked over lambing.

The set stocked and deferred mobs had equal numbers and were given a portion of farm with similar area, terrain, soils, pasture species, and soil fertility.

Feed budgeting
Pasture budgeting was carried out at the start of each year to ensure that pasture FOO levels were adequate to meet ewe gestation and lactation requirements. This was done for the deferred mob using estimated pasture growth for the region based on pasture type and soil fertility. Comparing this to stocking density and ewe requirements for different months of the year enabled us to work out a required FOO level prior to lambing that would ensure there was sufficient feed for ewes over lambing. The properties had similar required FOO levels of around 1400 kg/Ha for ewes pre-lambing.

3.2 Monitoring methodology

Pastures were monitored monthly. FOO estimates were undertaken using the MLA ruler by the group co-ordinator and Agriculture Victoria staff member and were calibrated using pasture cuts to determine an error factor. Feed quality assessment were also undertaken monthly.

Ewes from both mobs were condition scored at the start of the demonstration and approximately monthly throughout the demonstration. A minimum of 25% of ewes were condition scored on each occasion.

Lambing percentage was calculated at lamb marking as a percentage of the ewes in the paddock. This was necessary in the first year when some ewes had slipped between paddocks and was continued for consistency between years.

Ewe mortality was measured in years 2 and 3, however this was not possible in year 1 (2016) as sheep numbers between paddocks had changed as a result of ewes slipping under fences.

Lamb liveweight was measured in September each year and averaged for each treatment. A minimum of 25% of lambs were weighed on each occasion.

Feed costs were calculated each year based on actual feed purchased and used by producers. Lambs were valued according to MLA Market Information for Saleyard and Lamb Indicators - Victoria, by calendar year.

Labour costs associated with feeding were not included. Some producers have indicated that feeding in containment saves time as sheep are not spread across the farm, however this view was not held by everyone in the group. Benefits from maintaining ground cover were not costed into the demonstration.

3.3 Year 1: 2016 setup

The first year of the demonstration was conducted on a property near Penshurst, in 2016. Composites were used, with twin bearing ewes in each treatment. Both treatments had three equal-sized paddocks covering a total of 55 ha/ treatment, each with 110 ewes (330 in total/ treatment). The stocking rate for both treatments was 6 ewes /ha. Ewes in the set stocked treatment were rotated between the three paddocks prior to lambing.

The deferred mob was fed in containment for 40 days in 2016 (April 20 to May 30), on a diet of wheat and straw (Table 1). Feed was provided on the ground and heavy May rains caused the containment area to become quite muddy, however the site was reasonably well draining and feeding on the ground was not too problematic. The set stocked mob were initially supplementary fed, but this was discontinued as they rapidly gained condition.

A change to the planned methodology was implemented in early-June, owing to low FOO levels (<700 kg/DM/ha) in the set stocked paddocks and the producers' concerns of potential lamb and ewe losses. The decision was made to rest the set stocked paddocks for the two weeks prior to lambing (to allow more growth) and to reduce the size of the demonstration to two paddocks and 220 ewes in each treatment.

The difference from resting the pasture for two weeks (approximately 4600 kg DM not consumed by set stocked ewes) was offset by the fact that 330 ewes (not 220, the number of ewes in the new mob sizes) were grazing the set stocked paddocks prior to the deferred mob being released. The demonstration finished in September when the producer needed to reallocate paddocks.

Table 1: 2016 supplementary feed for deferred and set stocked ewes

Year/ site	No. of ewes	Days in confinement	Average daily supplementary feed /head	Total supplementary feed /head
Deferred	330	40	475g wheat 0.5 kg straw	19 kg wheat 20 kg straw
Set stocked	330	-	130 g wheat 0.35 kg straw	5.2 kg wheat 1.4 kg straw

3.3.1 Year 1: 2016 Rainfall

Figure 1 shows rainfall at the nearest BOM site to the host farm (The Gums), in 2016, which indicated a May break.

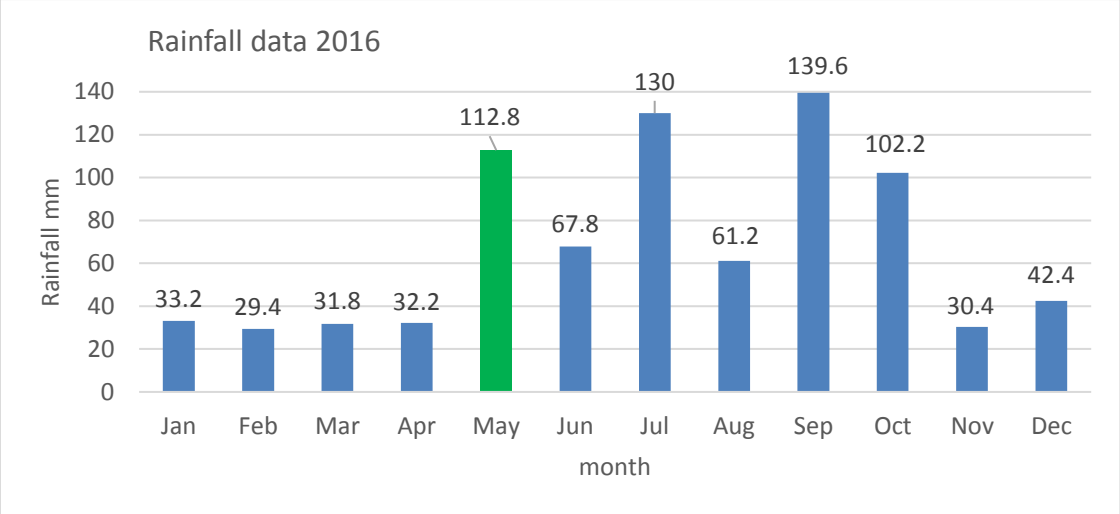


Fig: 1: Average monthly rainfall at 'The Gums' near site 1

3.4 Year 2: 2017 setup

In 2017, the demonstration was conducted on a property at Glenthompson. Composites were used, with 189 twin bearing ewes in each treatment over approximately 31 ha, a stocking rate of 8 ewes /ha. The set stocked ewes were rotated across the three paddocks then set stocked a week prior to lambing.

The deferred mob were confinement fed for 32 days (April 28 to May 29) on a diet of barley and straw (Table 2). The containment site was well drained and the producer did not report poor utilisation of grain. Transition to grain prior to the demonstration was quicker than would usually occur as a different producer had planned to host the demonstration then pulled out. The demonstration host had not anticipated feeding sheep, given the abundance of available pasture. The set stocked mob were not supplementary fed.

Table 2: 2017 supplementary feed for deferred and set stocked ewes

	No. of ewes	Days in confinement	Average daily supplementary feed /head	Total supplementary feed /head
Deferred	189	32	700g barley 0.4 kg straw	22 kg wheat 36 kg straw
Set stocked	189	-	-	-

3.4.1 Year 2: 2017 Rainfall

Figure 2 shows the rainfall data near the site in 2017, indicating summer rainfall and an early break.

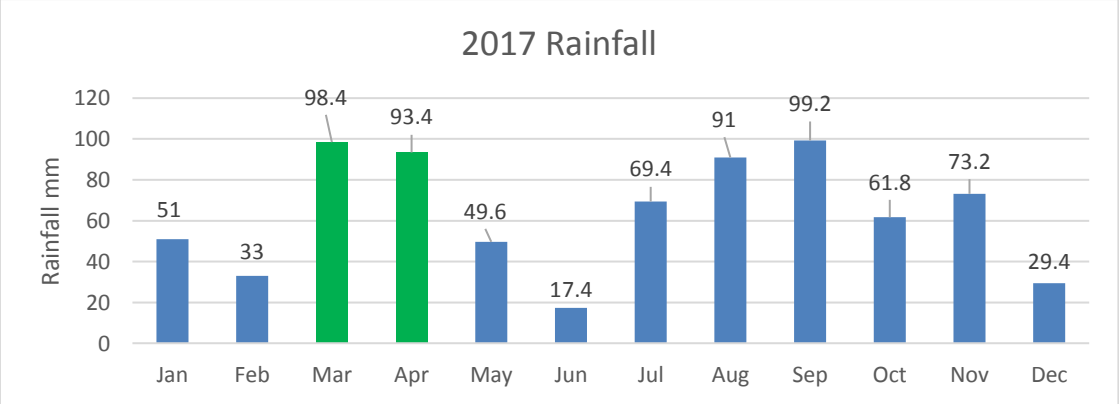


Fig. 2: Average monthly rainfall at 'The Gums' near site 2

3.5 2018 setup

The demonstration was conducted on a property near Dunkeld in 2018. This time merino ewes were used, with 238 twin-bearing ewes in each treatment across a 31ha paddock per treatment. The stocking rate was around 8 ewes/ha. Set stocked ewes had access to the entire paddock until one week prior to lambing. At that point, the paddock was divided into three to create smaller mob sizes, using electric fencing. The deferred mob were also run across one paddock when released from containment and were set stocked as three small mobs over lambing, using electric fencing. The electric fencing was taken down after lambing had finished and each treatment was run across the whole paddock.

The deferred ewes were fed a diet of wheat, hay and silage (Table 3) and were contained for 28 days, from April 30 to May 28th. The set stocked mob were also supplemented with some wheat and a small amount of hay in their paddock.

Wet conditions in May became problematic in the containment area causing the producer to twice let ewes out of containment into a nearby yard while the containment area dried out. This also restricted feed utilisation. The producer estimated around 40% of the feed was not eaten as ewes were fed on the ground. The combination of a poorly drained containment area, very wet conditions and merino (rather than composites) impacted on feed utilisation.

Both the set stocked and deferred ewes suffered hypocalcaemia, causing some loss of ewes. This was observed to be worse in the set stocked mob, where there was less dry standing feed; however ewe losses were even across treatments.

Table 3: 2018 supplementary feed for deferred and set stocked ewes

	No. of ewes	Days in confinement	Average daily supplementary feed /head	Total supplementary feed /head
Deferred	238	28	400g wheat 0.9 kg hay 1.1 kg Silage	14 kg wheat 27 kg hay 26 kg Silage
Set stocked	238	-	285 g wheat 0.19 kg hay	8 kg wheat 5 kg straw

3.5.1 Year 3: 2018 Rainfall

Figure 3 shows the rainfall data near the Dunkeld site, indicating a May break.

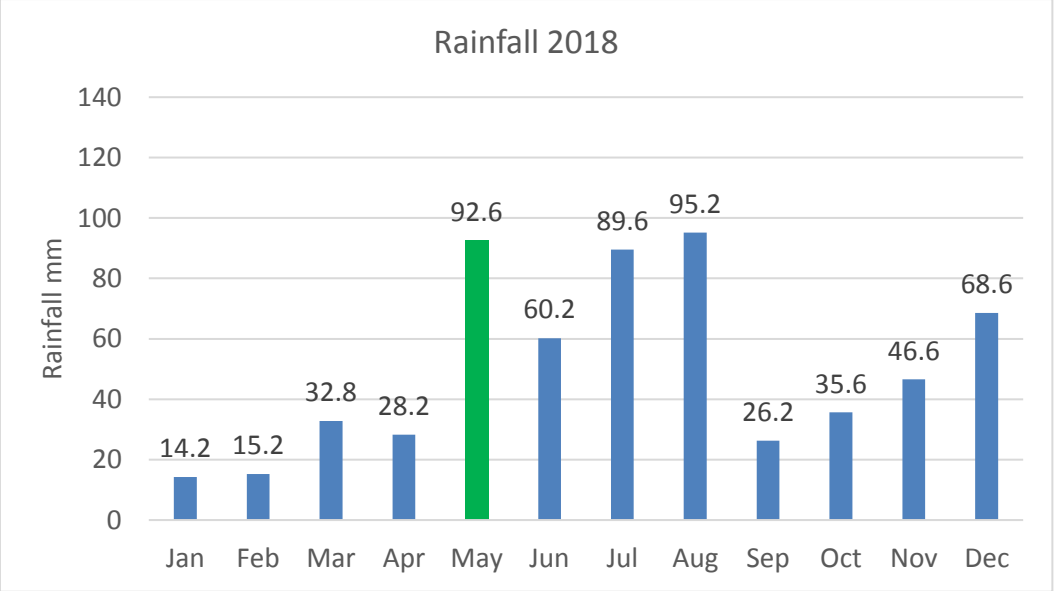


Figure 3: Average monthly rainfall at 'The Gums' near site 3

3.5.2 Extension activities

February 2016- meeting
Glenthompson-Dunkeld BWBL group discussed the demonstration to ensure everyone had a clear understanding of the trial. All attending the meeting completed the baseline evaluation survey, which was also completed online by any of the group unable to attend.

June 2016 – field day (25 producers in attendance)
Group field day to inspect the set stocked and deferred treatments prior to lambing. FOO estimation session was run to further develop skills.

June 2016 – article in 'Western District Farmer'

December 2016 – presentation at BWBL meeting
Results for year 1 were presented at the BWBL group meeting.

July 2017 – field day (15 producers attending).
Group field day to inspect set stocked and deferred paddocks and ewes prior to lambing. FOO estimation competition held to further develop skills. Inspection of sheep handling setup and stock containment areas. Presentation of results to date (2016 and 2017).

August 2018 – open field day (>60 people in attendance)
Widely publicised, open field day held at final site. Inspected and discussed treatment ewes and paddocks, FOO estimation competition, stock containment inspection/ discussion, presentations by the three host producers and project co-ordinators covering all results and implications. Interactive session on the pros and cons of autumn saving.

August 2018 – article in Beef and Sheep Newsflash

November 2018- final workshop, ADOPT and KASA survey

Final results presented. KASA survey and ADOPT model undertaken.

June 2019 – BWBL conference presentations (Approx. 180 in attendance)
Presentations as a concurrent session and the BWBL conference.

3.5.3 Monitoring and evaluation

Event evaluation

Wherever possible, events were evaluated using the project evaluation forms. The forms collected satisfaction data and likely adoption and practice change information**.**

KASAA change

Pre and post questionnaires were conducted with BWBL group members to evaluate their change in Knowledge, Attitude, Skills, Aspirations, Adoption (KASAA).

ADOPT workshop

The group were taken through the Adoption and Diffusion Outcome Prediction Tool (ADOPT) process (Kuehne *et al*, 2017) at the final workshop/presentation, to gain a better understanding of the impact of the project as viewed by the BWBL group members. The process was used to predict the extent and speed of adoption of autumn saving.

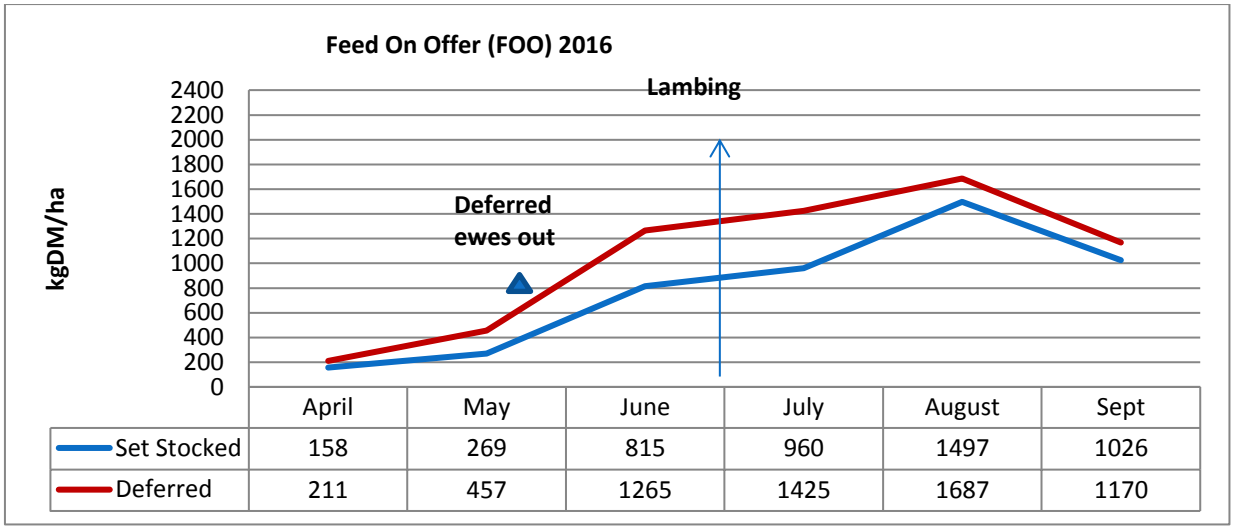
4 Results

4.1 2016: year 1 results

4.1.1 2016 Feed On Offer

The deferred paddocks were locked up for 40 days while sheep were in containment. The target FOO of 1400 kgDm/ha was reached at the start of July (Figure 4) and the deferred ewes had an extra 465 kgDM/ha ahead of them than the set stocked mob. The set stocked mob was 440 kg DM/ha below the target for twin bearing ewes at the point of lambing.

Figure 4 shows the greatest difference in FOO between treatments coincided with lambing and lactation, when feed demand was highest. FOO levels peaked in both treatments in mid-August.



	April	May	June	July	August	Sept
Set Stocked	158	269	815	960	1497	1026
Deferred	211	457	1265	1425	1687	1170

Fig 4: 2016 Feed on offer

Fig. 5: Set stocked pasture at point of lambing: FOO = 960 kg DM/ha

Fig. 6: Deferred pasture at point of lambing: FOO = 1425 kg DM/ha

Feed testing of pasture revealed no major differences in quality between set stocked and deferred paddocks (Appendix 1a).

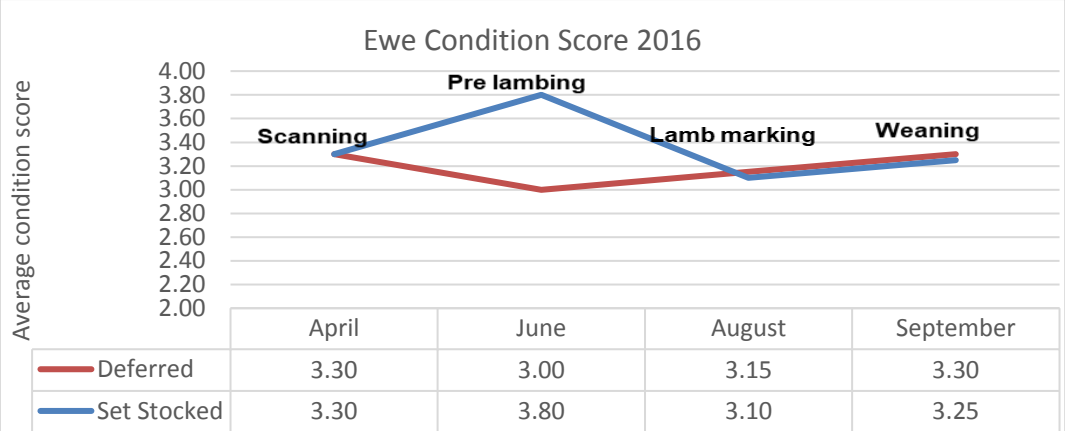
4.1.2 2016 Animal performance

4.1.2.1 Ewe condition score (CS)

The set stocked mob rapidly increased in condition when they were released into the paddock at the start of the demonstration; from 3.3 CS mid-April to 3.8 CS in early June (Figure 7). Condition in the set stocked mob then dropped from June until August, losing 0.7 CS over lambing and throughout early/mid lactation to 3.1 CS.

In contrast, the deferred mob lost 0.3 CS in containment, from 3.3 CS mid- April to 3.0 CS in early June. After their release into the paddock on May 30, the deferred mob continued to gain condition, over lambing and early/mid lactation, catching the set stocked mob in August.

At the end of the demonstration, both the deferred and set stocked ewes finished in good condition (3.30 CS and 3.25 CS respectively), with negligible difference between treatments.



	April	June	August	September
Deferred	3.30	3.00	3.15	3.30
Set Stocked	3.30	3.80	3.10	3.25

Fig. 7: 2016 ewe condition through the season

Fig. 8 Set stocked ewes (top) and deferred ewes (bottom) Deferred mob, May 11th, 2016

4.1.2.2 Lamb production

Immediately prior to lambing, each of the four demonstration paddocks were stocked with 110 ewes, however, by lamb marking it was apparent that ewes had slipped fences or had been incorrectly counted, or both (Table 5). Given the changes in ewe numbers (+4 ewes to -21 ewes), it was not possible to identify the number of ewe deaths per mob. An estimate of dry ewes revealed similar numbers between the set stocked and deferred mobs (15 in set stocked, 12 in deferred).

Table 5: 2016 lambing results and weights

	Pdk	Ewes at start of lambing	Ewes at end of lambing	Diff in ewe numbers	Estimate of dry ewes	No. lambs at marking	Lamb marking %	Average liveweight Sept kg	Average liveweight /ewe kg
Set stocked	1	110	99	-11	4	147	148%		
	2	110	113	3	11	156	138%		
Deferred	1	110	89	-21	3	121	136%		
	2	110	114	4	9	187	164%		
Av. Set stocked							150%	27.3	41.5
Av. Deferred							143%	25.2	36.0
Difference							7	2.1	5.5

Lamb marking percentage in the deferred mobs averaged 150 %, 7% higher than the set stocked mob (Figure 8). However, this was not consistent between treatment paddocks. Hazelwood, a deferred paddock had the lowest percentage (Table 5).

Lamb weights at lamb marking in September, were 2.1 kg heavier in the deferred mob than the set stocked mob (Figure 9).

The combination of the higher average lamb marking percentage and the heavier average lamb weights in the deferred mob achieved an extra 5.5 kg of lamb liveweight per ewe than the set stocked mob (Figure 10).

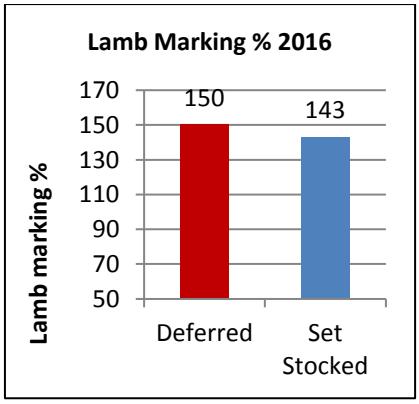


Fig. 9: 2016 lamb marking percentage

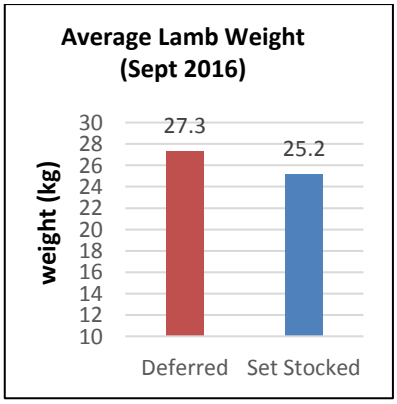


Fig. 10: Average lamb weight in September

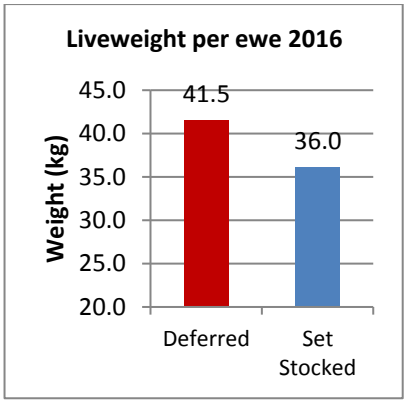


Fig. 11: Average liveweight per ewe

4.1.3 2016 Economics

4.1.3.1 Cost of containment

Feed costs for the deferred group were $7.13/ head or $2350 for the mob of 330 over the 40 days in containment. This compared to $1.54 per head or $510/mob for the set stocked treatment (Table 6). Feeding costs were $5.60 higher per head and $1850/ mob in the deferred treatment.

Table 6: 2016 Feed costs for deferred and set stocked mobs

Year/ site	Days in confinement	Average daily supplementary feed /head	Total supplementary feed /head	Cost of feed/head (Wheat $270/t, straw $100/t)	Total feed costs/ mob (330 ewes)
Deferred	40	475g wheat 0.5 kg straw	19 kg wheat 20 kg straw	$7.13	$2350
Set stocked	-	130 g wheat 0.35 kg straw	5.2 kg wheat 1.4 kg straw	$1.54	$510
Difference				$5.60	$1,850

4.1.3.2 Cost of extra feed grown

By the start of lambing on July 1, the deferred paddocks had grown an extra 465kDM/ha or 27 t of total dry matter across the paddocks than the set stocked treatment. This extra feed was calculated at $69/t DM using the cost of containment feeding (Table 7).

Table 7: 2016 cost of extra feed grown

* Extra cost of feed per head ($)	*Extra cost of supplementary feed / 330 ewes	Area (ha)	**Extra FOO (kg/DM/ha) July 1	Total feed grown (t DM)	Cost of extra feed grown ($/t DM)
$5.60	$1,850	58	465	27	$69

* From Table 6, ** From Figure 4,

4.1.3.3 Partial profit- difference between treatments

Lamb was valued at $2.65/kg using MLA Market Information for Saleyard and Lamb Indicators- Victoria 2016 calendar year (563c/kg CWT), and a dressing percentage of 47%.

The profit per ewe was $8.99 higher in the deferred mob ($102.85/ewe) than the set stocked mob ($93.86). At the stocking rate of six ewes per hectare, the deferred mob was $53.91/ ha more profitable than the set stocked mob.

Table 8: 2016 partial profit for deferred and set stocked ewes

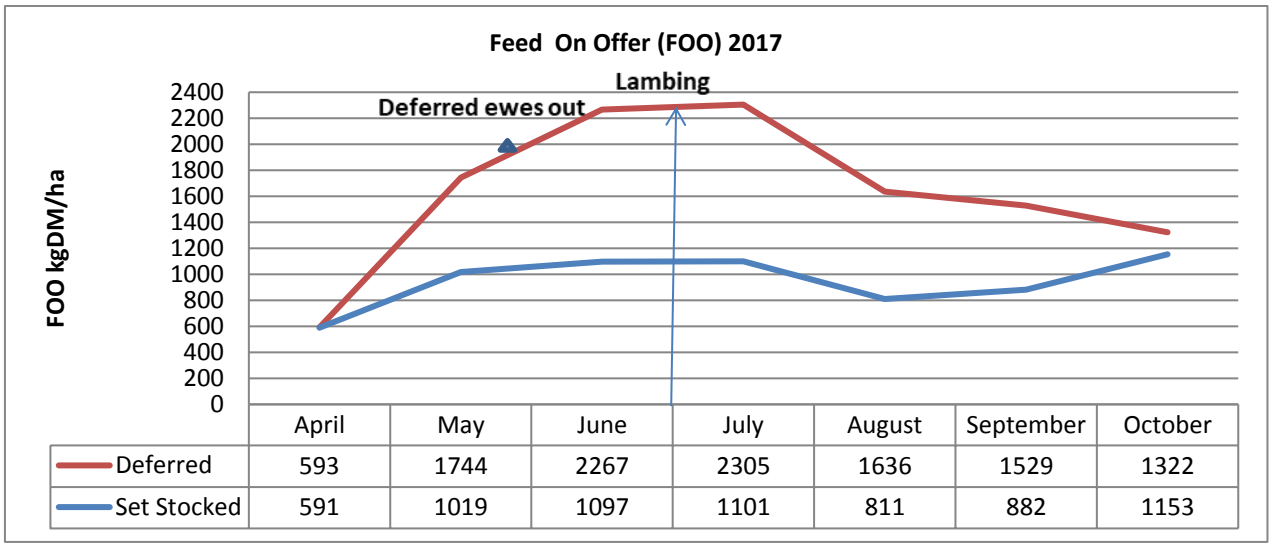
	Average lamb liveweight/ ewe kg	Income /ewe (@$2.65/kg liveweight)	Feed costs /ewe	Profit $/ewe	Profit /ha (6 ewes /ha)
Deferred	41.5	$109.98	$7.13	$102.85	$617.07
Set stocked	36.0	$95.40	$1.54	$93.86	$563.16
Difference	5.5	$14.58	$5.59	$8.99	$53.91

4.2 2017: Year 2 results

4.2.1 2017 Feed On Offer

The deferred paddocks were rested for 32 days while ewes were containment fed. Pasture growth was rapid in response to an early break (Figure 12) and the growth exceeded expectation. By the time the pasture was assessed in May, FOO had exceeded the target of 1400 kgDM/ha (Figure 11). The deferred mob were released at that point; however, the FOO continued to increase and had reached 2300kgDM/ha at start of lambing, 1200kgDM/ha more than the set stocked mob and 900kgDM/ha higher than the target FOO for twin bearing ewes at lambing.

Despite the early, good break, the set stocked mob was still 300kgDM/ha below the FOO target for twin bearing ewes at the point of lambing (Figure 13) and was low at 811kgDM/ha in August. Ewes and lambs were removed from one set stocked paddock in September due to concern of low FOO by the producer. This did not adversely affect results as the demonstration finished in September each year, however it does suggest the set stocked system was pushed to maintain adequate FOO at the end of lambing compared to the deferred system.



	April	May	June	July	August	September	October
Deferred	593	1744	2267	2305	1636	1529	1322
Set Stocked	591	1019	1097	1101	811	882	1153

Figure 13: 2017 feed on offer

Fig. 14: Set stocked pasture at point of lambing: FOO = 1100 kg DM/ha

Fig. 15: Deferred pasture at point of lambing: FOO = 2300 kg DM/ha

Feed testing of pasture revealed no obvious differences in feed quality between treatments, with the exception that crude protein appeared lower in the deferred paddocks (with higher FOO) than the set stocked paddocks in October (Table 9). This may reflect a drop in feed quality at the higher FOO levels in the deferred paddocks, however, the crude protein level was variable across the three paddocks measured, so this can't be confirmed. Appendix 1b shows the all the FOO and quality results for 2017.

Table 9: Pasture Feed On Offer (FOO), Digestible Dry Matter (DDM), Metabolisable Energy (ME) and Crude Protein (CP) in October.

		October		
Paddock	**Group**	**DDM**	**ME**	**CP**
1	Deferred	74	11.2	19.7
2	Deferred	77	11.7	22.2
1	Set stocked	75	11.3	26.9
2	Set Stocked	(not measured- removed from treatment in Sept)		

4.2.2 2017 Animal performance

4.2.2.1 2017 Ewe condition

Ewes started the demonstration in perfect condition (CS 3) for twinners (Figure 14). However, the deferred ewes had a slightly rushed transition on to grain and lost a small amount condition in containment. Ewe condition in the deferred mob increased to 3.16 CS when ewes were released into their paddock and there was little fluctuation throughout the season.

In contrast, the set stocked group increased in condition considerably as they were released into their paddock at the start of the demonstration, and gradually lost condition after June.

Ewes in the deferred mob finished 0.4 CS above the set stocked mob (Figures 15 and 20).

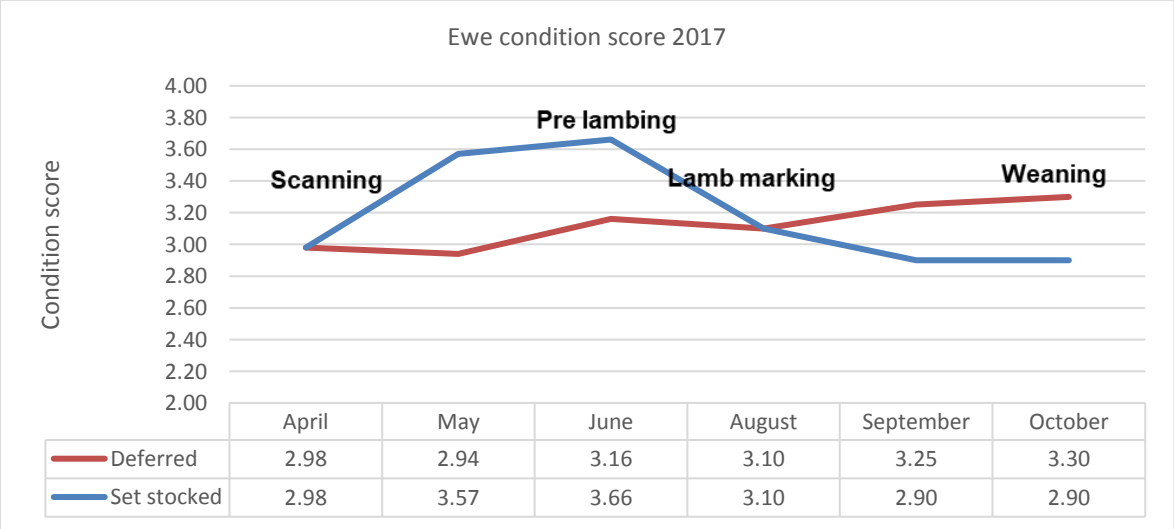


Fig. 15: 2017 ewe condition

Fig. 16: Ewes in the set stocked mob (left- CS=3.57) and deferred mob (right- CS= 2.94) in May 2017

4.2.2.2 2017 Lamb production

Both deferred paddocks had lower marking percentages than the set stocked paddocks (Table 10), averaging 14% fewer lambs than the deferred mob (Figure 17). There were few ewe deaths; four across the deferred paddocks and three across the set stocked paddocks.

Lambs weights in the deferred mob were on average 1.6 kg heavier than the set stocked mob in September (Table 10, Figure 18).

The lower lamb percentage, but higher lamb weights in the deferred mob resulted in liveweight production per ewe 0.6 kg lower than the set stocked mob (Figure 19).

Table 10: Lambing percentages, survival and weights

	Paddock	Ewes at start of lambing	Ewes at end of lambing	Deaths	No. lambs at marking	Lamb marking % (of ewes at marking)	Mean lamb weight Sept (kg)	Average liveweight production /ewe (kg)
Deferred	**Parking Bay**	76	74	2	118	159%	24.7	39.3
	New	113	111	2	174	157%	24.9	39.1
Set stocked	**Railway**	89	87	2	152	175%	22.8	39.9
	Lucerne	101	100	1	168	168%	23.6	39.6
Av. Deferred						158%	24.8	39.2
Av. Set stocked						172%	23.2	39.8
Difference						-14	1.6	-.6

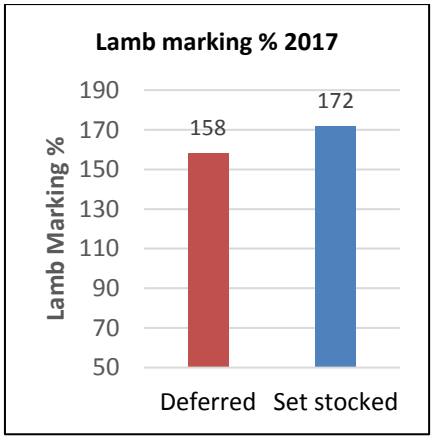


Fig. 17: 2017 lamb marking percentage

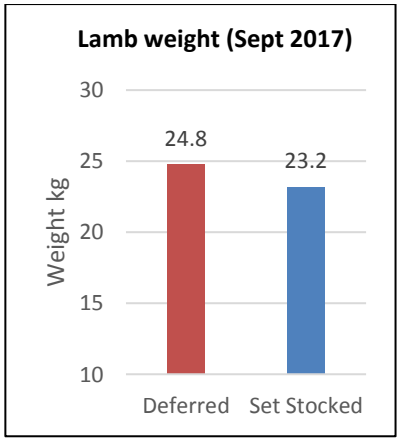


Fig. 18: 2017 average lamb weight in (Sep)

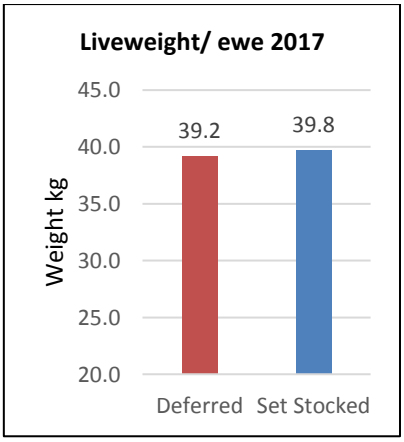


Fig. 19: 2017 average liveweight per ewe (Sep)

4.2.3 2017 Economics

4.2.3.1 2017 Cost of containment

Containment feeding for 32 days cost $4.40/head and $832 for the deferred mob of 189 twin bearing ewes (Table 11). The set stocked mob incurred no supplementary feeding costs.

Table 11: 2017 supplementary feed and cost for deferred and set stocked ewes

Year/ site	Days in confinement	Average daily supplementary feed /head	Total supplementary feed /head	Cost of feed/day/head (Wheat $270/t, straw $100/t)	Total feed costs/ mob (189 ewes)
Deferred	32	700g barley 0.4 kg straw	22 kg wheat 36 kg straw	$4.40	$832
Set stocked	-	-	-	-	-
Difference				$4.40	$832

4.2.3.2 Cost of extra feed grown

At the start of lambing on July 1, the deferred paddocks had grown an extra 28 t of dry matter. This extra feed cost $29/tDM, calculated using the cost of containment feeding (Table 12).

Table 12: 2017 cost of extra feed grown

* Extra cost of feed per head ($)	*Extra cost of supplementary feed / 330 ewes	Area (ha)	**Extra FOO (kg/DM/ha) July 1	Total feed grown (t DM)	Cost of extra feed grown ($/t DM)
$4.40	$832	23.5	1200	28	$29

* From Table 11, ** From Figure 11

4.2.3.3 Partial profit: Difference in income between treatments

Lamb was valued at $2.95/kg using MLA Market Information for Saleyard and Lamb Indicators- Victoria 2017 calendar year (628c/kg CWT), and a dressing percentage of 47%.

The profit per ewe was $6.17 lower in the deferred mob ($111.24) than the set stocked mob (Table 13). At the stocking rate of eight ewes per hectare, the deferred mob was $49/ ha less profitable than the set stocked mob.

However, the deferred mob carried, on average, 0.4 CS more at the end of the demonstration (Figure 18), which can be accounted for through feeding costs that could be required to get ewes in condition for joining. An estimated cost of $6.07 (Table 13) would bring the set stocked ewes to the same condition score. This cost would put the deferred treatment $0.10/head or $0.80/ha behind of the set stocked mob.

Table 13: 2017 partial profit

	Average lamb liveweight/ ewe kg	Income /ewe (@$2.95/kg liveweight)	Feed costs /ewe	Profit $/ewe	Profit /ha (8 ewes /ha)
Deferred	39.2	$115.64	$4.40	$111.24	$889.92
Set stocked	39.8	$117.41	$0.00	$117.41	$939.28
Difference	- 0.6	$1.77	$4.40	-$6.17	-$49.36
	Ewe condition	Liveweight difference (kg)	*Cost to make up condition difference	Profit/ ewe $	Profit/ ha (8 ewes /ha)
Difference	0.4	6.6	$6.07	-$0.10	-$0.80

*Feed conversion efficiency (4:1) Grain costs $0.23/kg (Nov 2017 barley price). Note this Feed conversion efficiency is very low but, in this instance, it would be providing additional energy and protein to their diet to get added weight gain. Every additional kilogram of feed will go straight into weight gain rather than the first proportion of it being required for maintenance.

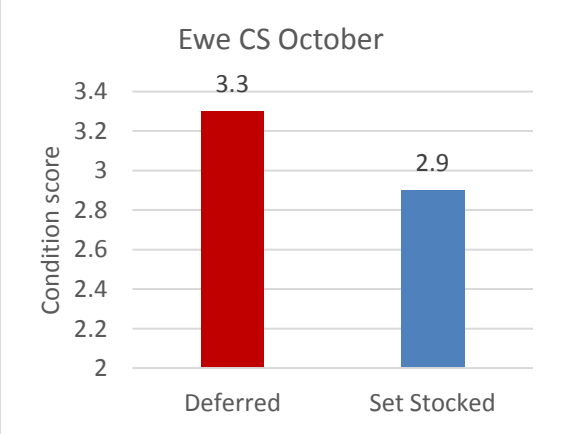


Fig 20:Condition score (deferred and set stocked) in October 2017)

4.3 2018: Year 3 results

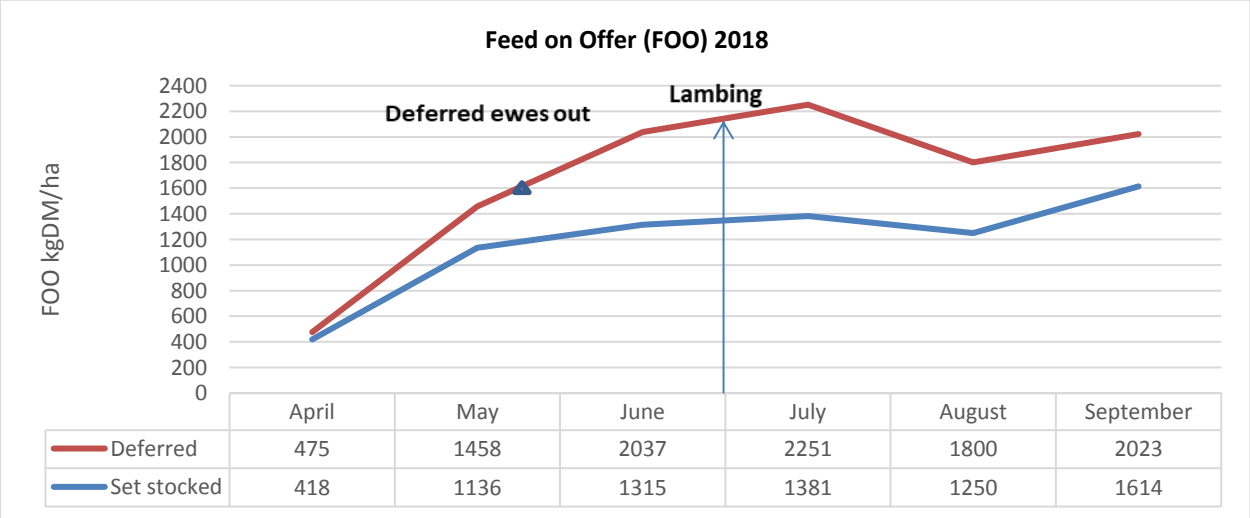
4.3.1 2018 Feed On Offer

The deferred paddocks were rested for 28 days (April 30- May 28) in 2018, by which point the FOO target of 1400 kg DM/ha had been reached (Figure 212). FOO continued to increase across both

treatments until mid-July, in-part driven by a mid-June Nitrogen application to both treatments, which resulted in significant pasture growth.

By the start of lambing on July 1, the deferred paddocks had reached 2250 kg DM/ha (850 kgDM/ha above the target FOO) and the set stocked mob were very close to the twin-lambing ewe target FOO for the deferred paddocks. FOO remained adequate in the set stocked mob and high throughout the deferred paddocks.

Appendix 1c show feed quality and FOO measurements through the season which were similar between treatments except for crude protein, which had reduced by September (Table 14) in the deferred paddock with high FOO (>2000 kgDM/ha).



	April	May	June	July	August	September
Deferred	475	1458	2037	2251	1800	2023
Set stocked	418	1136	1315	1381	1250	1614

Fig. 21: 2018 feed on offer through the season

Fig. 22: FOO 10 days prior to lambing in deferred (2000 kg DM/ha)

Fig. 23: FOO 10 days prior to lambing in set stocked paddocks (1300 kg DM/ha)

Table 14: Pasture Feed On Offer (FOO), Digestible Dry Matter (DDM), Metabolisable Energy (ME) and Crude Protein (CP) in September

September				
Treatment	**FOO**	**DDM**	**ME**	**CP**
Deferred	**2023**	73	11	14.1
Set stocked	**1614**	71	10.5	18.4

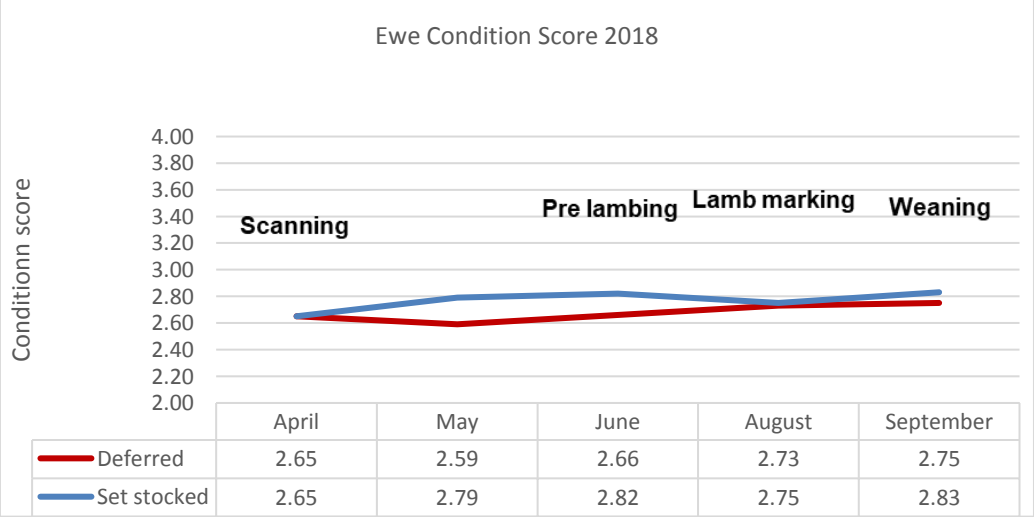
4.3.2 2018 Animal performance

4.3.2.1 Ewe condition

Ewes started the demonstration at CS 2.65, which is lower than the recommended 3.0 CS for twin bearing ewes. However, these were older merino ewes that were not given priority prior to the demonstration. The set stocked ewes gained some condition in the paddock and were around 2.8 CS at lambing. However, the deferred ewes lost condition in containment and didn't gain enough in the paddock to reach the set stocked ewes, lambing at around 2.7 CS.

The poor feed utilisation from feeding on the ground in wet conditions would have led to the drop in condition in the deferred mob. This reduced condition may have affected the lambing percentage and the overall result for the deferred mob.

By August, ewe condition was very similar between the two mobs. The two mobs finished in September in similar condition, however, the set stocked ewes on the better-quality pasture were gaining condition faster than in the deferred ewes.



	April	May	June	August	September
Deferred	2.65	2.59	2.66	2.73	2.75
Set stocked	2.65	2.79	2.82	2.75	2.83

Fig. 24: 2018 ewe condition

4.3.2.2 2018 Lamb production

The deferred mob had 6% lower marking percentage (143%) than the set stocked mob (149%) (Table 15, Figure 25). Both mobs lost 12 ewes, largely caused by hypocalcaemia, and the set stocked mob had one dry ewe more (9) than the deferred mob (8).

By September, lambs in the deferred mob were on average 1.8 kg lighter (22.0 kg) than the set stocked ewes (23.8 kg) (Figure 26). This coincided with lower crude protein and higher FOO in the deferred paddock.

The combination of lower lambing percentage and lower lamb liveweight resulted in 4kg lower average liveweight production per ewe in the deferred mob than the set stocked mob (Figure 27).

Table 15: 2018 lambing information and liveweights

	Paddock	Ewes at start of lambing	Ewes at end of lambing	Deaths	Dry ewes	No. lambs at marking	Lamb marking % (of ewes at marking)	Mean lamb weight Sept (kg)	Average liveweight production /ewe (kg)
Deferred	**Old Yella**	238	226	12	8	324	143	22.0	31.5
Set stocked	**North West**	238	226	12	9	337	149	23.8	35.5
Difference		0	0	0	1	-13	-6	-1.8	-4

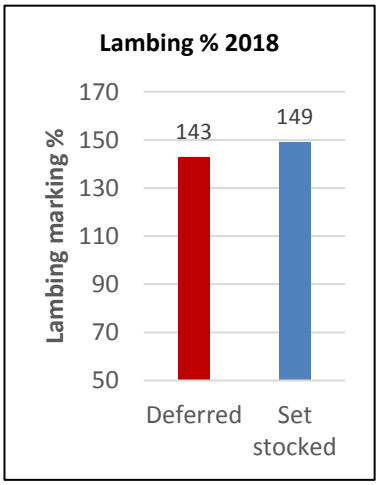


Fig. 25: 2018 lamb marking percentage

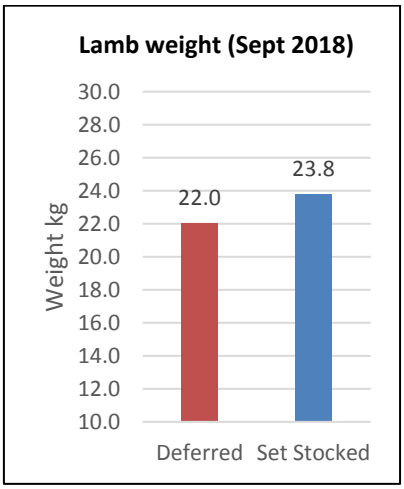


Fig. 26: 2018 average lamb weight in September

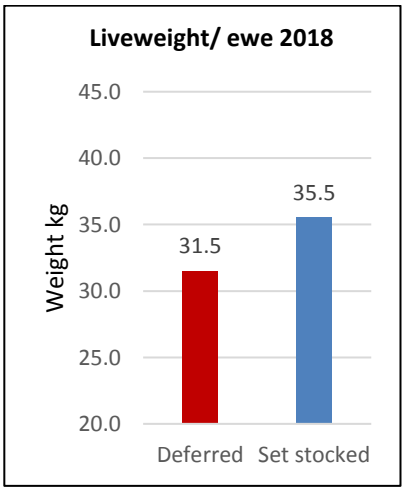


Fig. 27: 2018 average liveweight per ewe (Sept)

4.3.3 2018 Economics

4.3.3.1 2018 Cost of containment

Containment feeding for the 28 days cost $8.40/head and $2000 for the deferred mob of 289 twin bearing ewes (Table 16) This was an extra $5.50/head more than the set stocked mob, which cost $2.90/head and $690 per mob. The high cost for the deferred mob was partly the result of low feed utilisation caused by feeding on the ground and wet, muddy conditions in the stock containment area.

Table 16: 2018 cost of supplementary feed for deferred and set stocked ewes

Year/ site	Days in confinement	Average daily supplementary feed /head	Total supplementary feed /head	Cost of feed/day/head (Wheat $290/t, hay $110/t, silage $50/t)	Total feed costs/ mob (289 ewes)
Deferred	28	400g wheat 0.9 kg hay 1.1 kg Silage	14 kg wheat 27 kg hay 26 kg Silage	$8.40	$2000
Set stocked	-	285 g wheat 0.19 kg hay	8 kg wheat 5 kg straw	$2.90	$690
Difference				$5.50	$1,310

4.3.3.2 Cost of extra feed grown

By the start of lambing on July 1, the deferred paddocks had grown an extra 28 t of dry matter. This extra feed was calculated at $47/t DM, calculated using the cost of containment feeding (Table 17).

Table 17: 2018 cost of extra feed grown

* Extra cost of feed per head ($)	*Extra cost of supplementary feed / 238 ewes	Area (ha)	**Extra FOO (kg/DM/ha) July 1	Total feed grown (t DM)	Cost of extra feed grown ($/t DM)
$5.50	$1310	32	870	28	$47

* From table 16, ** From Figure 19,

4.3.3.3 Difference in income between treatments

Lamb was valued at $3.26/kg using MLA Market Information for Saleyard and Lamb Indicators- Victoria 2018 calendar year (694c/kg CWT), and a dressing percentage of 47%.

The profit per ewe was $13.04 lower in the deferred mob ($102.69) than the set stocked mob ($115.73) (Table 18). At the stocking rate of eight ewes per hectare, the deferred mob was $148.32/ ha less profitable than the set stocked mob.

Table 18: 2018 partial profit per treatment

	Average lamb liveweight/ ewe kg	Income /ewe (@$3.26/kg liveweight)	Feed costs /ewe	Profit $/ewe	Profit /ha (8 ewes /ha)
Deferred	31.5	$102.69	$8.40	$94.29	$754.32
Set stocked	35.5	$115.73	$2.90	$112.83	$902.64
Difference	-4	-$13.04	$5.50	-$18.54	-$148.32

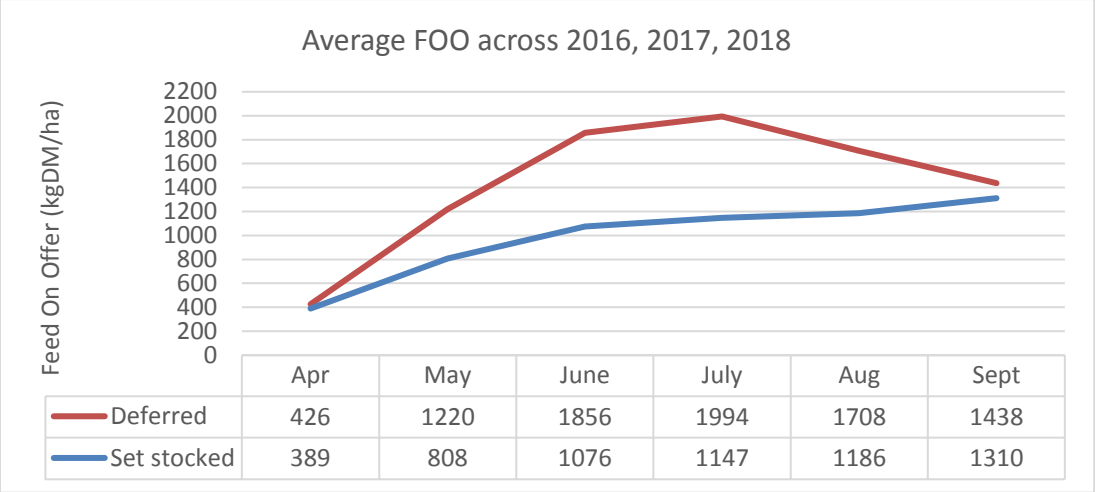
4.4 Summary across the three years

4.4.1 Feed On Offer- all years

Feed on offer followed a similar pattern for set stocked and deferred paddocks across the season in each year. The average FOO across the three years (Figure 28) shows a rapid increase in the deferred paddocks, continuing after ewes were released in late May. Deferred FOO levels then plateaued in late June-July as temperatures drop, then decline mid-July. The target FOO of 1400kgDM was reached on average, in late May. Average FOO in the set stocked paddocks increased at a much slower rate and never reached the target of 1400kgDM/ha for lambing ewes. At lambing (July 1), the average FOO was just over 1100kgDM/ha.

Feed Quality

Feed quality was similar between the deferred and set stocked paddocks with the exceptions of October 2017 and more so, September 2018, when lower crude protein was measured in deferred paddocks. This coincided with higher FOO levels than in the set stocked paddocks.



	Apr	May	June	July	Aug	Sept
Deferred	426	1220	1856	1994	1708	1438
Set stocked	389	808	1076	1147	1186	1310

Figure 28: Average feed on offer across the three years

4.4.2 Animal performance – all years

Ewe Condition

In each year, ewe condition dropped in the deferred mob while in containment, and the drop was larger the longer the ewes were contained (Figure 29). In 2016 and 2017, the set stocked ewes rapidly gained condition as they went on to the paddocks and then began to lose condition in June. This was less dramatic in 2018, when merino ewes were used. In contrast, the deferred ewes gradually gained condition once they were out of containment, each year. In 2018 both the set stocked and deferred ewes were low in condition all the way through the demonstration.

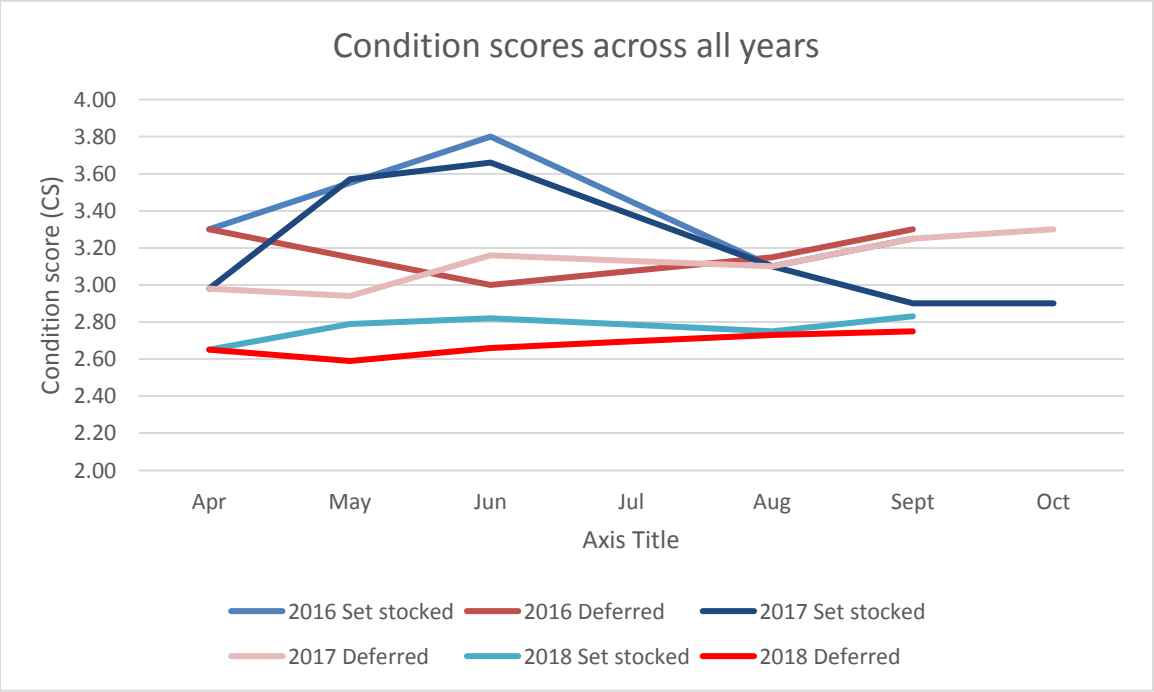


Fig. 29: Condition scores (CS) across all years.

Lamb production

Average lambing percentage was highest in the deferred mob in 2016, but higher in the set stocked mobs in 2017 and 2018 (Table 19). Average lamb weight at September was highest in the deferred mobs in 2016 and 2017, but higher in the set stocked mob in 2018. Average lamb liveweight production per ewe was highest in the deferred mob in 2016 (5.5kg difference). It was similar, but marginally higher in the set stocked mob in 2017 and was 4kg higher in the set stocked mob in 2018.

Table 19: Lambing percentage, average lamb weight in September and average liveweight per ewe across all years

	Av. lambing %			Av. lamb weight in September (kg)			Av. liveweight per ewe (kg/head)		
	2016	**2017**	**2018**	**2016**	**2017**	**2018**	**2016**	**2017**	**2018**
Deferred	150%	158%	143%	27.3	24.8	22.0	41.5	39.2	31.5
Set Stocked	143%	172%	149%	25.2	23.2	23.8	36.0	39.8	35.5
Difference	7	-14	-6	2.1	1.6	-1.8	5.5	-0.6	-4

Fig. 30: Lamb marking 2016

4.4.3 Economics- all years

Costs of containment

Table 20 show that the average time in containment for the deferred mobs was 33 days. However, as explained above, ewes were contained too long in 2017 and 2018 as FOO had exceeded the target of 1400kgDM/ha by the second pasture measurement.

On average, containment cost $5.17 per ewe in feed costs. Across the three years, an average of 847 kg DM/ha or 27.7t/DM total feed, was grown across the deferred paddocks at an average cost of $48 per tonne (Table 20).

Table 20: Average days in containment, feed costs, starting FOO, extra FOO and cost of extra feed grown

	Days in containment	Cost of feed/ ewe ($)	FOO at start of lambing kgDM/ha	Extra FOO at start of lambing (v's set stocked)	Total extra FOO grown across deferred paddocks (t DM)	Cost of extra FOO ($/t)
2016	40	$5.60	1425	465	27	$69
2017	32	$4.40	2305	1205	28	$29
2018	28	$5.50	2251	870	28	$47
Average	**33**	**$5.17**	**1994**	**847**	**27.7**	**$48**

Partial profit

Table 21 shows the income was nearly $9/ewe higher in the deferred mob in 2016. In 2017, the income was $6.17 higher in the set stocked mob, however the deferred mob was only $0.10 behind when the extra condition was valued. Income was $18.54 higher the set stocked mob in 2018.

Table 21: Income per ewe across the three years

	2016 Income per ewe (@$2.65/kg)	**2017** Income per ewe (@$2.95/kg)	**2018** Income per ewe (@$3.26/kg)
Deferred	$102.85	$111.24	$94.29
Set stocked	$93.86	$117.41	$112.83
+Value of extra CS (deferred)		$6.07	
Difference	**$8.99**	**-$0.10**	**-$18.54**

4.5 Extension activities

4.5.1 Activities

Table 22: Extension activities, attendance and evaluation

Extension event	**Activity**	**Number of participants**	**Av satisfaction (/10)**	**Value of innovation (/10)**	**Value of demonstration (/10)**
BWBL group meeting Feb 2016	Collection of demo data from sites 1 & 2 General discussion of results	25			
June 2016 – BWBL group field day	Collection of demo data from sites 1 & 2 General discussion of results	20			
June 2016 – article	'Western District Farmer'				
BWBL group meeting Dec 2016		6			

July 2017 – BWBL group field day		15	8.6	8.3	8.7
August 2018 – Open field day		52	8.2	8.1	8.5
August 2018 – article in	Beef and Sheep Newsflash				
BWBL group meeting Nov 2018	Final presentation and interpretation of results, ADOPT	14			

Fig. 31: FOO estimation competition

4.6 Monitoring and evaluation

KASA

A pre and post evaluation survey on the demonstration was completed with members of the Glenthompson-Dunkeld BWBL Group. This evaluation measured changes in knowledge, attitude, skills, aspirations and adoption (KASAA) for five objectives shown below (Figures: 28-32). The surveys involved producers rating their current level of KASAA from 1-10 against each of the demonstration objectives. In the case of adoption, producers could be using some of the practices or infrequently using practices prior to the demonstration and would rate themselves out of 10 accordingly. For example, some producers were using containment feeding prior to the demonstration in dry years but were letting ewes out at the autumn break rather than waiting for target FOO levels to be achieved. In the post demonstration evaluation, some producers were initiating autumn saving because of the demonstration, whilst others were had altered their containment use or feeding process.

The following figures summarise the results of this evaluation survey.

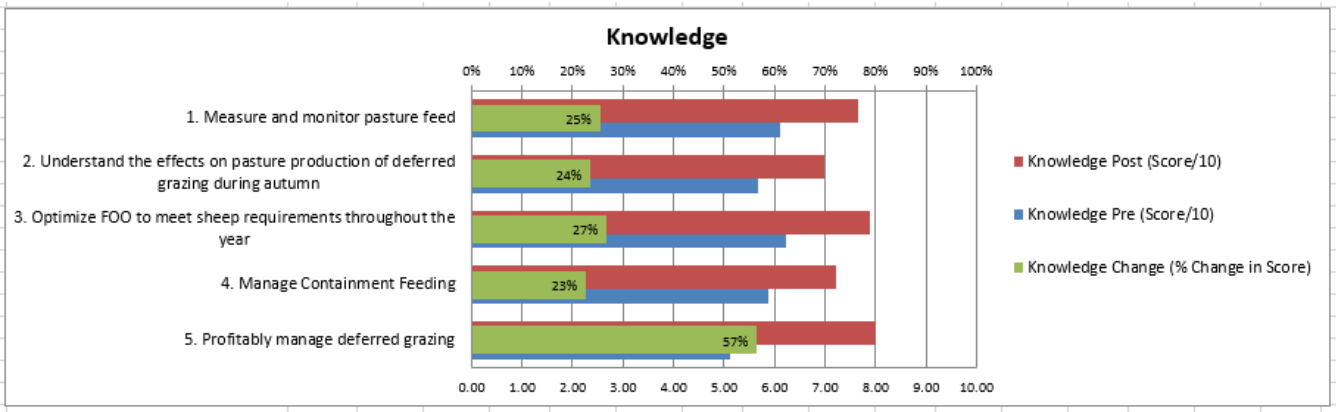


Fig. 32: Knowledge pre, post and change.

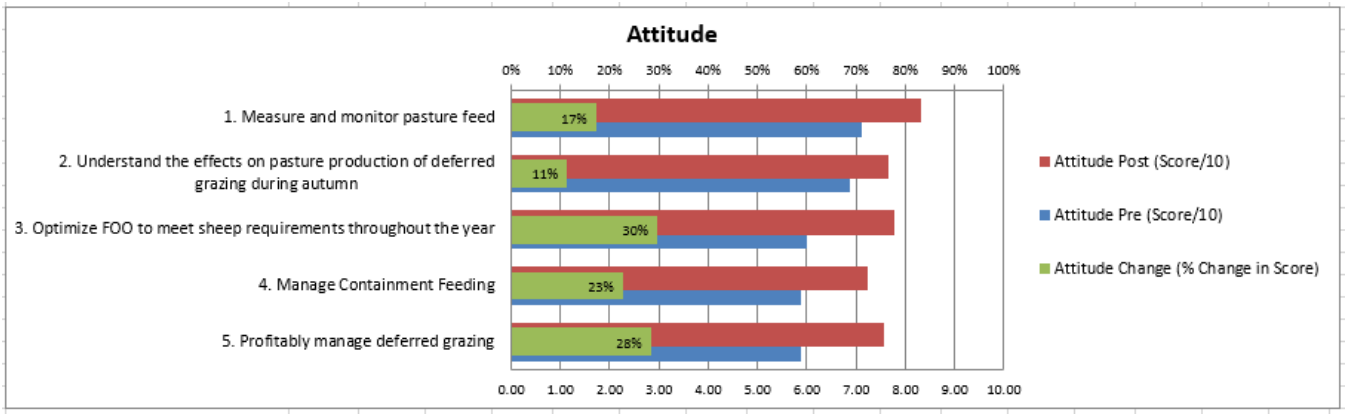


Fig. 33: Attitude pre, post and change.

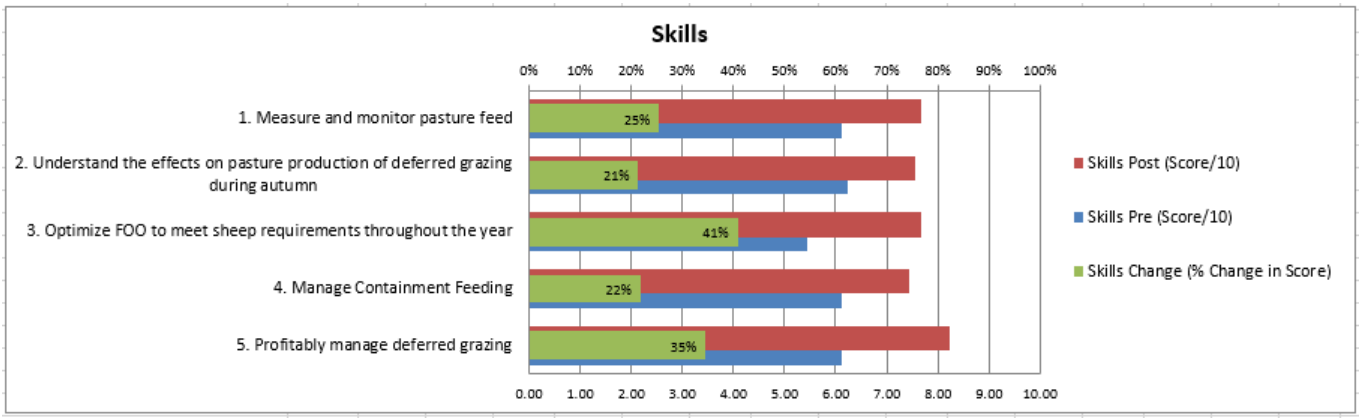


Fig. 34: Skills pre, post and change.

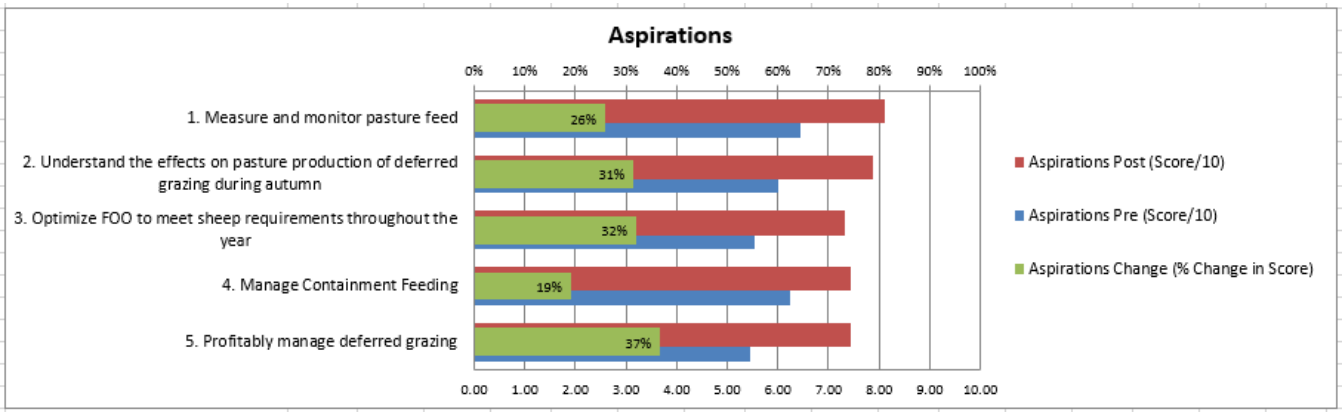


Fig. 35: Aspirations pre, post and change.

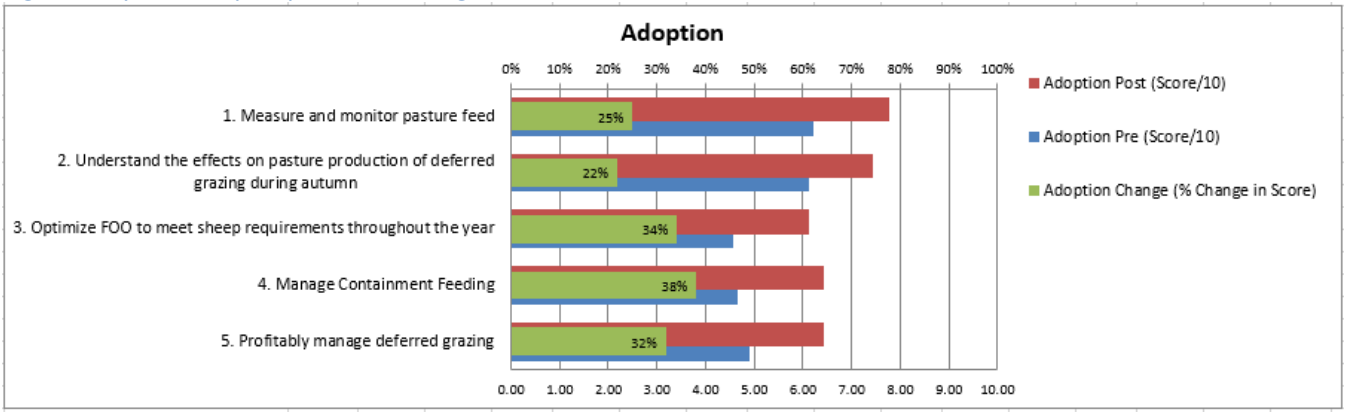


Fig. 36: Adoption pre, post and change.

ADOPT

The ADOPT model was run with the group following the final presentation of results. The group defined the innovation as 'Containment feeding of ewes in autumn to allow pastures to achieve feed on offer targets for lambing' and the population the model was run for 'Victorian prime lamb producers '.
The results of the ADOPT model were extremely optimistic, providing a peak level of 98% adoption in 7 years (Table 23, full result Appendix 3).

Table 23: ADOPT model results

Predicted peak level of adoption[1]	98%
Predicted years to peak adoption[2]	7
Time to 50% peak adoption	3
Predicted adoption level in 5 years from start	87%
Predicted adoption level in 10 years from start	98%

5 Discussion

5.1 Year 1 (2016)

Of the three years of demonstration, Year 1 produced the most successful results in favour of autumn saving (achieving a partial profit $8.99 higher than the set stocked mob).

The autumn break arrived in May (Figure 1). Ewes were contained for 40 days, which was the longest period in containment of the three years. As a result, ewes were fed longer at a higher cost per head ($5.60).

By the time the deferred ewes were released into their paddock, FOO was around 1200kgDM/ha. However, this reached 1425kgDM/ha at the start of lambing, perfectly achieving the 1400kgDM/ha target without causing wastage or compromising pasture quality. In contrast, the set stocked ewes lambed onto 960kgDM/ha, which was low and caused the producer a degree of stress. This FOO level would have been lower if not for changes made to the demonstration (see methodology) to prevent animal health implications and further supports autumn saving practices for the site and season.

Ewes started at 3.3 CS, which would be considered to be close to the ideal condition score for a twin composite ewe based on lifetime maternals work (A. Thomson, 2017). Despite ewe condition dropping in containment (to 3.0CS), this did not appear to adversely affect the lambing percentage, with the deferred mob producing a higher lambing percentage (150) than the set stocked mob (143). However, changes in ewe numbers between paddocks makes it difficult to interpret this result. Conditions were not ideal during lambing. July rainfall was well above average and mean 24-hour wind speed in July was also higher than the long-term average. This may have impacted on lambing percentages in both treatments.

The extra FOO throughout the season in the deferred paddocks compared to the set stocked paddocks resulted in higher lamb weights in September at the end of the demonstration. FOO in the deferred paddocks reached a maximum of just under 1700kgDM/ha in August and maintained comparable quality to the set stocked paddocks.

Table 24 summarises these results, along with results of 2017 and 2018.

5.2 Year 2 (2017)

Year 2 (2017) had an early (March) autumn break, following good rains over summer (Figure 2). Many in the BWBL group would question the need for autumn saving this season given the good soil moisture levels and potential for pasture growth.

The deferred ewes spent 32 days in containment, which retrospectively was too long as FOO had already reached 1700kgDM/ha when they were released and continued to grow, reaching 2300kgDM/ha by lambing. Monthly pasture inspections were insufficient and in hindsight, we should have asked the host producer to provide a weekly FOO estimate for the deferred paddocks. This resulted in wasted FOO and higher feed costs (totalling $4.40/ewe) than was necessary in such a good season. Despite such a strong season, FOO in the set stocked paddocks was 300kgDM/ha short of the target 1400kgDM/ha by lambing.

Ewe condition dropped marginally (by 0.1CS) in the deferred ewes whilst in containment. The host producer felt that the transition to grain had been somewhat rushed when he decided to take on the demonstration, which may have been the cause. It is also possible that this hastened acclimatisation to grain had an impact on the lambing percentage in the deferred ewes (14% lower than set stocked), which may have been caused by embryonic loss in containment. Otherwise, it is difficult to account for the lower lambing percentage in the deferred mob given that the producer did not notice any difference in lamb mortality between the two mobs.

Despite a lower lambing percentage, the lambs in the deferred mob averaged 1.6kg heavier than the set stocked mob by September (Figure 18). The combination of lower lambing percentage and heavier weights led to lamb production per ewe in the deferred mob -0.6kg/ewe lower than the set stocked mob (Figure 19).

The deferred ewes finished the demonstration in 0.4 CS better condition than the set stocked mob. This difference equated to 6.6kg liveweight. Extra condition at that point in the season has implications on the level of supplementary feed required over the summer-autumn period and on the conception rates in ewes. While this is highly variable depending on genetics it is estimated a 10-15% increase in

conception rates would be achieved in ewes with an additional 0.4 of a CS at joining (pers comm D Gordon, Livestock Logic).

Overall, in 2017, the deferred group were marginally less profitable than the set stocked group, which can be attributed to extra feed costs brought about by keeping the ewes in containment longer than required and more so, to the lower lambing percentage in the deferred mob. The cause of this is unclear but lambs may have been aborted in containment. Even in 2017, with summer pasture growth and an early break, the set stocked mob didn't reach the target FOO of 1400kgDM/ha, which led to lower lamb weaning weights.

5.3 Year 3 (2018)

The 2018 season had a similar start to 2016, with a May break, and there were early expectations that the season would suit autumn saving. Merino ewes were used in the 2018 demonstration, unlike the previous years which were run with composites.

The deferred mob were containment fed for 28 days which, similar to 2017, was too long and FOO had already reached the target FOO for lambing of 1400kgDM/ha by the time the ewes were released. FOO in the deferred paddocks continued to increase and by the start of lambing had exceeded 2200kgDM/ha.

This high FOO level had been boosted by an application of urea (which had also been applied to the set stocked paddocks) and had not been anticipated by the project co-ordinators. The urea application (costing approximately $50/ha) had resulted in FOO in the set stocked paddock essentially reaching the target FOO for twin bearing ewes of 1400kgDM/ha at the start of lambing. The urea application had not been required for the deferred paddock and in this situation was not only waste money and resources, but also caused FOO to increase to an extent that pasture was not utilised and quality declined.

The older, culled merino ewes started the demonstration at 2.65 CS, which is lower than the desired 3.0 CS. The condition of the deferred mob dropped by 0.2 CS in containment, which may have led to the 6% lower lambing percentage than was achieved in the set stocked mob.

Management of ewes in containment became problematic in the wet. Ewes were fed on the ground and feed utilisation was extremely low once the containment areas became muddy, estimated by the host producer at around 40%. In addition, ewes were moved into holding yards twice while the containment areas dried out, adding to labour requirements.

The pattern in ewe condition over the season was different in the merino ewes to what was observed the previous two years with composite flocks. Composite set stocked ewes in both years had rapidly gained around 0.6 CS up until lambing, after which they lost around 1.0 CS by September. In comparison, the merino set stocked ewes had a smaller (0.2 CS), more gradual increase in condition, despite the large amount of feed available.

Overall, the set stocked mob was $18.54 /ewe less profitable than the deferred mob. Likely contributors to this result were the lower lambing percentage, potentially caused by a drop in ewe condition in containment, and lower weaning weights, which was probably a result of lower pasture quality brought about by under-grazing. The longer than necessary period in containment coupled with

poor feed utilisation from eating on the ground in wet conditions, also caused feeding costs to be higher than required.

5.1 Across years

Table 24 summarises the season, containment factors, costs, FOO differences and results across the three years, between the set stocked and deferred mobs. It shows that the deferred mob was the most profitable in 2016 only. However, it also shows that there were several management issues in 2017 and 2018 that influenced results (in red) such as the length of time and condition score in containment, addition of urea, feed wastage, excess FOO at lambing and potentially embryo loss in containment. These management issues can all be addressed through better monitoring and practice change could lead to a better outcome in line with 2016 results. Having observed the impact of these factors throughout the demonstration, producers identified several practice changes such as not feeding on the ground in containment (see field day feedback below).

Table 24: Summary of factors affecting autumn saving outcomes in each year. Red indicates factors that negatively affected the results and profit margin from autumn saving.

Year/ Site breed	Season		Containment factors			Feed costs (Grain price)	FOO at lambing KgDM/ha		Results (deferred mob v's set stocked mob)				
	Break	Days in containment	Condition in containment (CS)	Feed waste	Wet		Set stocked	Deferred	Lamb %	Wt at end (kg)	Kg LW/ ewe	Value/ ewe 2016@2.65 2017@2.95 2018@3.26	Ewe CS at end
2016 Penshurst (composite)	May break	40	3.3- 3.0			**$5.60/ ewe** (Wheat = $270/t) (Hay = $100)	985	1425	+7%	+2.1	+ 5.7	+$8.90	+0.05
2017 Glenthompson (composite)	March break & April follow-up	32 (too long)	3.0 – 2.9 Transition to grain?			**$4.40/ ewe** (Barley = $145/t) (Straw = $90)	1100	2305 (High)	-14% (Embryo loss?)	+1.6	-0.6	-$6.17 (excluding CS value)	+ 0.4
2018 Dunkeld (merino)	May break (Urea added)	28 (too long)	2.65 – 2.60 (low) (merino)	Estimate 40% (Wet, poorly drained)	Removed stock twice	**$5.50/ ewe** (Wheat = $290/t) (Hay = $110) (Silage $50)	1380	2250 (High)	-6% (Embryo loss?)	-1.8	-3.9	-$18.54	-0.08

5.2 Timing of the break

Some producers in south west Victoria autumn save pastures (utilising stock containment areas) every year and swear by the practice as a means of managing ground cover, cost effectively increasing pasture production and managing higher stocking rates.

Over the three years of the demonstration, the autumn break arrived twice in May (2016 and 2018) and once in March (2017). The early break in 2017 produced conditions that would challenge the benefits of autumn saving, with good rainfall and subsequent pasture growth throughout autumn. Despite this, (without supplementary feed) the set stocked paddocks failed to reach the target FOO of 1400kg/ha for twin bearing ewes, instead reaching 1100kgDM/ha, (whilst peaking in condition at 3.7 CS). This led to lower lamb weights and caused concern from the host producer that the set stocked mob would run out of feed in late July/ August.

5.3 Pasture production

The demonstration showed that autumn saving was a cost-effective means of producing pasture, averaging $48/t of extra feed (485kgDM/ha) grown over the three years. This was calculated using the cost of supplementary feeding sheep in containment over that period. The steep growth rates (Figures 4, 12, 21) in the deferred paddocks compared to set stocked paddocks occurred by allowing the leaf area to establish and the plants to grow more quickly.

The value of $48/t compares favourably with urea. An 80kg/Ha application of urea would typically cost $50-60 and increase FOO by approximately 500-600kg in late autumn, therefore costing around $100/tonne of feed. Locking sheep off pastures grew grass for around half the price.

The average length of time that sheep were in containment was 33 days, however it is likely that this could have been reduced in both 2017 and 2018,as FOO significantly exceeded the target of 1400kgDM/ha at lambing.

5.4 Potential to lift stocking rate

The value of containment could be better captured by the ability to run extra stock through winter, which then allows for the increased utilisation of feed through spring. The containment feeding accumulated on average, an additional 800kg DM/Ha of pasture FOO.

In comparison, paddocks that are set stocked in south west Victoria encounter approximately 100 days (May 20 until the end of August) when pasture growth is not able to meet demand of twin bearing ewes at high stocking rates. Based on 8 twin bearing ewes eating 2.5kg DM/day pasture growth needs to exceed 20kg DM/Ha before there is excess growth.

Therefore, an additional 800 kg DM/Ha can be used to run (conservatively) an additional two ewes per hectare through the winter period. This is based on 60% feed utilisation (over winter) and ewes requiring 2.5kg of feed per day throughout the winter period (100 days). If running 8 ewes to the hectare, this increased potential stocking rate cost is $40/hectare. The return on running an addition two lambing ewes will vary considerably from property to property, but with some local producers

returning >$40/DSE annually, these two additional ewes (equal to at least 4 DSE), allows for an increased return per hectare of approximately $120.

5.5 Managing ewes in containment

Ewes lost condition in containment each year, varying from 0.05-0.3 CS, and didn't regain condition until they were released on to paddocks. In 2016, ewes started the demonstration at a high condition score of 3.3, dropping to 3.0 in containment. This did not appear to adversely affect lamb production. However, in 2017, the deferred ewes had a rushed transition on to grain and minor drop in condition, which coincided with 14% fewer lambs than the set stocked mob. Furthermore, in 2018, ewes entered containment in low condition (2.65 CS) and dropped a small amount of condition due to wet and muddy conditions within the containment area. This coincided with 6% fewer lambs than the set stocked mob. From these results, it would seem that:

- Managing ewes in containment after the autumn break is challenging due to rain, particularly on heavy soils.
- Feeding on the ground can reduce utilisation, wasting money and adversely affecting ewes.
- It is difficult to maintain or increase condition in containment.
- The impact of a loss in condition is less significant if starting at a good condition score profile (greater than 3.0 CS).

5.6 Other benefits from autumn saving

Ground cover was not monitored throughout the demonstration. However, during the ADOPT process, producers identified that autumn saving has a potentially 'LARGE environmental benefit' through increased ground cover and the prevention of over grazing.

The group also discussed labour requirements for autumn saving. Some producers felt that feeding in containment saved time in comparison to feeding across paddocks, however others in the group felt that autumn saving would increase their labour requirements.

Feedback included:

- 'I work off farm over autumn- much quicker to manage stock and get more time at work'
- 'Feeding in containment is quick and easy and we are set up to use it when we need it. It is good for controlling condition, but I wouldn't try to put on weight'.
- 'Once you've got the rules in place, it's pretty simple. We just do a hay budget at the start, we know we're going to keep them in containment for 6 weeks, we know what ME level we're giving them in the hay, and then we just make up the difference with the grain ration and young sheep, are getting the barley/lupin mix (extra protein) while the older ones get the energy source. And you can feed a lot of sheep in a fairly short time. It's all very handy to the yards, you can get them in, you can condition score them, weigh them, you can do all that – it's all easy'.
- My top five reasons for using autumn saving are…
    1 To get adequate levels of pasture for our lambing ewes.
    2 Not knocking pasture on the head when it's trying to get going (grow more grass during winter)
    3 Higher stocking levels – we're able to control animal intake far better in the last trimester

4 Convenience – it's a labour saver
5 You know you're not going to have to feed animals during lambing. I've done it before and I hated it with a passion.

The following pros and cons of autumn saving were listed by participants at the final field day open to the general public:

Pros

- Controlling the decision about feeding - how much to which sheep
- Grow extra FOO at a low cost
- Peace of mind that FOO is available at lambing
- Ewe condition is improved meaning reproductive benefits for the following year (improved CS at lactation can lead to 10% better repro performance according to MLA webinar)
- Participants observed better lambing percentage (though not observed in the last 2 years of the demonstration)
- Heavier lambs at weaning
- Longer life from pasture by not overgrazing: management of groundcover
- Feeding is faster in containment compared to paddocks
- Reducing the winter feedgap

Cons

- Feeding in containment in autumn can be challenging- especially if wet. Lesson learnt about the benefit of feeding off the ground
- Infrastructure required
- Feeding time compared to not feeding at all
- Disease spreads through a mob
- Managing condition in containment can be challenging- in two years, ewes dropped CS and had lower lambing percentage
- Discussion about which years to autumn save… less beneficial with an early break though some advocate doing it each year

5.7 Project delivery

Generally, the project delivery ran smoothly and according to the project plan. Both producers and the project co-ordinators learnt a great deal about the benefits of autumn saving and more so about management requirements to achieve these benefits. Feedback from producers include:

- It is evidence based and makes the results believable, which is very different to just hearing something in the pub.
- It's not like using a tiny strip of fertiliser- we are seeing this on-farm. Last year parts of the demonstration site got too wet and it made me think that every farm and every situation is different and we need to adapt.
- The demonstration pulls together all our skills; all that we've learnt in the last 15 years and we use all this knowledge and it refreshes it.
- It's a great way to learn around the place- to get people there and share ideas. We are collectively forming a template that will suit most people.

If the demonstration were conducted again, we would attempt to monitor deferred pastures more frequently in the first month to better match the release date of ewes to hit the 1400kgDM/ha at lambing without exceeding it.

Lambing percentages across paddocks are unpredictable and had a large influence on the demonstration outcomes. Another way of evaluating autumns savings may have been to focus on the ability to run more sheep. Stocking rate is a major profit driver and autumn saving clearly allows you to make the step to running more sheep over winter.
There is always an element of unpredictability to on-farm demonstrations that can at times impact on results. In this case it was ewes slipping fences in 2016 and urea applications in 2018. There's not much that can be done in these situations, other than account for and learn from changes encountered.

5.8 Project evaluation

The demonstration was evaluated through the pre and post KASAA survey as well as surveys undertaken at field days.

5.8.1 KASAA

The KASAA evaluation measured changes in the knowledge, attitude, skills, aspirations and adoption of the BWBL group. These measures were assessed against the following parameters:

1. Ability to measure and monitor pasture feed
2. Understanding the effects on pasture production of deferred grazing during autumn.
3. Ability to optimise FOO to meet sheep requirements throughout the year
4. Ability to Manage Containment Feeding
5. Ability to profitably manage deferred grazing

Knowledge
Producers indicated their knowledge had increased across all parameters, ranging from 23% to 57%. The largest change in knowledge was for 'Ability to profitably manage deferred grazing'. Overall, the group had indicated a good initial knowledge of all parameters, which increased to 7 or 8/10.
Comments from producers include:

- "I thought I was doing it but have learnt a lot about the different requirement of the different types of sheep that were used for the demo. It was incredible how little FOO was required for composites to gain CS and in comparison, how slow the merino ewes were to gain CS even on good levels of FOO. SO I thought I was managing sheep well but realise there was large variations in industry guidelines to get the performance compared to actual performance e.g. maternals don't need FOO like LTEM materials would recommend".

Attitude
Attitude to all parameters improved by between 11-30%. Generally, the producers had a positive attitude to the parameters from the start.

Skills
Producers indicated their skills had increased across all parameters, ranging from 21-43%. The Producers rated their skills at 5-6 out of 10 prior to the demonstration and 7.5-8 out of 10 after the

demonstration, with the biggest changes being in their ability to optimise FOO to meet sheep requirements and to profitably manage deferred grazing.

Comments from producers include:

- Our visual estimations for quality are very ordinary unless feed is 100% lush clover (optimal). Once it comes off that level, I think we do a poor job of estimating its digestibility and therefore the production levels of the animals grazing it

Aspirations

Producers indicated that their aspirations to manage each parameter had increased between 19-37%. The highest change was for their ability to profitably manage deferred grazing.

Adoption

Adoption increased across all parameters, ranging from 22-38%. The highest change was for profitably managing deferred grazing.

Comments from producers include:

- Still designing containment areas but will have them ready to roll this autumn to ensure we hit pasture targets by the 10th of June, hopefully sooner but rainfall dependent
- Not using yet but setting up for it this autumn
- So far, we haven't needed to use the deferred grazing in our 100% merino operation. But now have the confidence to use if the season dictated
- Use containment pens most years but will continue to but as pens get very muddy will now use small paddocks and large lane ways to continue deferred grazing for longer especially with spring lambing ewes and let early winter lambing ewes out
- Will be this year. Most important thing is doing your pasture budget to ensure you let the sheep out of containment and onto grass at the time that will allow for minimum FOO requirements to be met but not exceeded as growing grass and not utilising it is very expensive as we saw in the years when the autumn breaks were very good

5.8.2 Field day feedback- intended adoption and practice change

Over the course of two BWBL group field days and one field day open to the public, 61 percent of attendees indicated that they would make changes areas and management based on demonstration findings, 30% indicated they were unsure if they would make changes and 9% indicated that they would not make changes. The following planned changes were identified by producers:

- Introduction of deferred grazing.
- Look more closely at FOO requirements at my more northern property.
- Continue deferred grazing.
- Be selective in using containment areas depending on season.
- Containment feed. Look into other ways to containment feed.
- We are looking at making permanent pens.
- Work on feed system in containment and ensure ewes hold condition.
- Continue to autumn save using containment & manage pasture.
- Further develop my containment area with trough feeders.

- Lock up paddocks for twin bearing ewes earlier and containment feed if needed to achieve FOO.
- Manage ewe CS better prior to going into autumn saving feeding.
- Build containment lot and autumn save.
- Confirms what we already do.
- Better feeding systems for autumn saving system.
- Doing it but need a bit of fine tuning- lamb 1st September.
- Better condition score management.
- Look at ways to value the pasture surplus.
- Recommend autumn saving to producers wanting to improve production & stocking rates.
- Better management of twins and pasture.
- Will one day set up containment areas both for drought and managing pregnant ewes.
- More autumn saving (x2).
- Consider running more ewes.
- Run more ewes through containment.
- Lamb earlier.
- Leave in containment longer.

Producers at the field days indicated that they expected the following benefits expected from making the changes listed above:

- Save on time & grow more winter feed.
- Improved pasture growth & persistence & increased animal performance.
- Manage ewes better & manage pastures better.
- Better pastures for lambing.
- Increased winter feed on offer.
- Better outcomes and increased income.
- More FOO and better ewe condition.
- More kg/lamb/ha at weaning.
- Increased ability to carry more ewes/ha.
- Better lamb percentage & weaning weights.
- Plan to meet targets early.
- Improved stocking rates & improved ewe condition.
- Autumn save to increase FOO for lactating twinners to increase weaning weight & grow more grass.
- Better lambs & maybe higher stocking rates.
- Greater control.
- Better pasture growth throughout the year.
- Better stock condition & more money
- Lift wool and lamb production, more profit
- Run more ewes

ADOPT

The ADOPT results predicted adoption levels of 87 % in 5 years and the peak level of adoption was 98% which would take 7 years.

These predictions indicate extremely high adoption over a short period of time for the tested innovation. This outcome could be related the producers' interpretation of the questions, and their shared view that the management practices involved in autumn saving were simple and achievable. However, the demonstration results indicate that autumn saving requires appropriate monitoring and management to get the system right.

5.9 Extension messages

5.9.1 Autumn saving is a cost-effective method of increasing pasture production

Cost-effective increases in pasture production was a clear benefit from autumn saving. The average containment of 33 days led to an extra 850 kgDM/ha at the point of lambing (July 1). This was an average of extra 27.7t DM grown at each site at a cost of $48/t (calculated using the cost of feeding sheep in containment). The value of $48/t is approximately half of the estimated cost of achieving this growth using urea.

5.9.2 Managing ewes in containment can be challenging

This is true particularly after the autumn break when frequent rain leads to wet, muddy conditions. Ewes lost condition in containment in each year of the demonstration and the longer they were in containment, the more condition they lost. From these results, it would seem that:

- It is difficult to maintain or increase condition in containment.
- Feeding on the ground will reduce utilisation, wasting money and adversely affecting ewes.
- The impact of a loss in condition is less significant if starting at a good condition score profile (greater than 3.0 CS).

5.9.3 Pasture budgeting and monitoring is important

In two of the three years, FOO levels of the deferred paddocks at lambing considerably exceeded the target of 1400 kg DM/ha. This was despite undertaking pasture budgets and indicates the importance of checking FOO weekly while sheep are in containment and re-budgeting accordingly. Excess FOO that is not consumed equates to additional costs in supplementary feed in containment and as well as wastage in the paddock and potentially a reduction in pasture quality.

5.10 Objectives and outcomes

5.10.1 Demonstrate the increased productivity that results from meeting pasture production levels for ewes through autumn saving.

Increased pasture production was measured at each site; however, productivity increases were only seen for twin bearing ewes in 2016. This was due to other factors such as ewe condition and containment set up, which provided a further learning opportunity for producers involved in the demonstration.

5.10.2 Generate economic data on the relative profitability of autumn saving (animals withheld from pasture in autumn until FOO target is met) versus normal practice (strategic rotationally grazed, low input, 2-3 paddocks per mob) for the district.

Livestock production was measured over each year for the autumn saving treatment and the 'normal practice' treatment and the relative profitability was calculated.

The average time in containment for the deferred mobs was 33 days. However, in 2017 and 2018 as FOO had exceeded the target of 1400kgDM/ha by the second pasture measurement and containment time and costs were higher than required. On average across the three years, containment cost $5.17 per ewe in feed costs.

Across the three years, an average of 847 kg DM/ha or 27.7t/DM total feed, was grown in the deferred paddocks at an average cost of $48 per tonne.

Income was nearly $9/ewe higher in the deferred mob in 2016. In 2017, the income was $6.17 higher in the set stocked mob, however the deferred mob was only $0.10 behind when the extra condition was valued. Income was $18.54 higher the set stocked mob in 2018 (Table 21). The poor economic performance of the deferred mobs in 2017 and 2018 were more a reflection on management factors than the autumn saving concept.

5.10.3 Increase the knowledge and skills and adoption of autumn saving.

Three field days and a workshop were held over the three years of the demonstration. All BWBL members indicated that their knowledge and skills for managing autumn saving had increased (KASAA survey). Many of the group and participants at field day suggested they would adopt aspects of autumn saving or would adopt practice changes based on the demonstration findings.

6 Conclusions/recommendations

Overall, the demonstration showed that autumn saving is a cost-effective method for growing feed for lambing ewes in winter; more economical than urea. However, the demonstration also highlighted several potential pitfalls in the system that can severely impact the profitability of autumn saving. It is unlikely that sheep will gain condition in containment, and more likely that some condition will be lost, so it is important that they are in good condition prior to entering containment and transitioned well on to supplementary feed. Producers who are successfully managing autumn saving suggest that it is a good way to manage feed requirements for different stock classes.

Managing stock in containment after the autumn break can be challenging due to rain and feeding on the ground should be avoided as it will cause wastage and impact on ewe condition.

Feed budgeting and regular pasture monitoring are a must, to accurately predict FOO at lambing. If ewes enter the paddock too early, target FOO will not be achieved, impacting on animal health and nutrition. However, if deferment is too long, containment costs will be higher than necessary, and pastures may be underutilised causing wastage and subsequent reductions in quality.

It was estimated that extra feed grown through autumn saving may enable producers to run an extra two ewes per hectare.

6.1 Future R&D

A big learning from the demonstration was that maintaining condition on ewes in confinement is a challenge after the autumn break, when pens become muddy and wet. This is an annual problem in south west Victoria and worthy of further development to find better ways to hold sheep off pastures without them being exposed to such harsh conditions.

6.2 Application to the red meat industry

The demonstration has shown that additional feed can be grown cost effectively through the process of autumn saving, which can help to meet pasture production targets for twin bearing ewes. However, the findings are also applicable to the use of stock containment during dry periods or when ground cover falls below target levels. It shows that removing stock from pastures allows them to recover and leads to more growth and more rapid growth and that the cost of supplementary feed during this period can be recovered.

The findings around managing ewes in containment (section 5.5) are also applicable to the general use of stock containment areas.

6.3 Activities to increase adoption

Further value from the demonstration results could be achieved from the following activities:

- Development of a fact sheet or case study that clearly discusses results and benefits and management considerations for autumn saving that can be shared on the Agriculture Victoria and MLA website and publicised through local press.
- Presentation at the BWBL conference (planned for June 2019) and/or webinar open to all producers.

Some results coming from the demonstration have already been incorporated into presentations by Agriculture Victoria staff to other groups and this will continue to occur. Some information coming from the demonstration is complimentary to the promotion of stock containment areas and may be provided in that context.

7 Bibliography

Thompson, A. (2017) Lifetime Maternals – development of management guidelines for non-Merino ewes. Final report, MLA

8 Appendix

8.1 Appendix 1: Feed on offer and pasture quality information over monitoring

Table 1a: Pasture Feed On Offer (FOO), Digestible Dry Matter (DDM), Metabolisable Energy (ME) and Crude Protein (CP) on sample days 2016

		April				May				June				July	August				Sep
Pdk	Group	FOO	DDM	ME	CP	FOO	DDM	ME	CP	FOO	DDM	ME	CP	FOO	Foo	DDM	ME	CP	FOO
1	Set Stocked	185	69	10.3	24.5	221	63	9.2	19.2	592	69	10.3	22.8	960	1508	68	10.1	20.8	1026
2	Set Stocked	177	81	12.3	27.2	239	71	10.6	21.8	487	65	9.5	19.3	960	1429	72	10.8	14.7	x
3	Set Stocked	110	73	10.9	22.8	302	74	11	25	1040	65	9.5	17.9	x	x	x	x	x	x
1	Deferred	110	73	10.9	22.8	302	74	11	25	1583	70	10.4	22.2	x	x	x	x	x	x
2	Deferred	168	74	11.1	26.6	424	70	10.3	21.9	1319	73	11	22.3	1890	1593	74	11	18.6	935
3	Deferred	360	75	11.2	21.5	681	71	10.6	19.8	1240	66	9.7	17	1190	1879	62	9	13.3	1404

Table 1b: 2017Pasture Feed On Offer (FOO), Digestible Dry Matter (DDM), Metabolisable Energy (ME) and Crude Protein (CP) on sample days

		April			**May**			**June**			**July**			**Aug**			**Sep**			**Oct**		
Paddock	**Group**	**DDM**	**ME**	**CP**	**DDM**	**ME**	**CP**	**DDM**	**ME**	**CP**	**DDM**	**ME**	**CP**	**DDM**	**ME**	**CP**	**DDM**	**ME**	**CP**	**DDM**	**ME**	**CP**
1	Deferred	65	9.6	23.3	69	10.3	17.3	80	12.2	19.3	77	11.6	16.3	74	11.1	17.9				74	11.2	19.7
2	Deferred	63	9.3	21.5	67	9.9	20.2	80	12.1	22.5	80	12.2	20.3	76	11.4	21.9	67	9.1	14.9	77	11.7	22.2
1	Set stocked	69	10.3	23.8	61	8.9	15.6	75	11.3	23.8	82	12.4	24.5	68	10.1	17.5				75	11.3	26.9
2	Set Stocked	69	10.3	23.2	60	8.6	16.1	69	10.3	18.2	64	9.4	21.4	72	10.7	17.6	62	9.1	14.9			

Table 1c: Pasture Feed On Offer (FOO), Digestible Dry Matter (DDM), Metabolisable Energy (ME) and Crude Protein (CP) on sample days

	Date	**30-Apr-18**				**24-May-18**				**20-Jun-18**				**9-Aug-18**				**14-Sep-18**			
Paddock	**Group**	**FOO**	**DDM**	**ME**	**CP**	**FOO**	**DDM**	**ME**	**CP**	**FOO**	**DDM**	**ME**	**CP**	**FOO**	**DDM**	**ME**	**CP**	**FOO**	**DDM**	**ME**	**CP**
1	**Deferred**	**475**	69	10.4	21.5	**1458**	66	9.7	19.5	**2037**	73	10.9	19.0	**1800**	71	10.6	16.4	**2023**	73	11	14.1
2	**Set stocked**	**418**	72	10.8	22.2	**1136**	71	10.6	21.7	**1315**	66	9.8	17.9	**1250**	61	8.9	15.6	**1614**	71	10.5	18.4

8.2 Appendix 2: Evaluation interviews: May 2017

Group Coordinator's Feedback

Andrew Whale- group co-ordinator

The benefits I see are…

- More control over ewe nutrition and guaranteed FOO at lambing
- Getting birth weight right for lamb survival. We have 100% control so ewes are not too heavy or not too light
- Producers can see the demonstration first hand and can visually see the results and have ownership of them – rather than just reading about it
- They can 'kick the tyres'. Visual is very important
- It will be important to get the results out to other groups and producers too

Producers' Feedback

Darren runs 5000 ewes in a prime lamb enterprise near Hamilton, Victoria.

What do you see as the pasture benefits?

Just grow more grass. So many farmers, just as soon as they see green grass, their sheep are out… nip nip nip. The grass is trying to punch on. We just get the leaf area up, we get the solar panels up, and grow a lot more grass.

And stock health benefits?

Well we hope we get to our required levels for twinners and singles, we can manage our single paddocks accordingly, and manage our twinner paddocks accordingly. Also we should have our maximum survival.

And actually managing the animals in containment. Is that harder or easier?

Once you've got the rules in place, it's pretty simple. We just do a hay budget at the start, we know we're going to keep them in containment for 6 weeks, we know what ME level we're giving them in the hay, and then we just make up the difference with the grain ration and young sheep, blue tags, are getting the barley/lupin mix (extra protein) while the older ones get the energy source. And you can feed a lot of sheep in a fairly short time. It's all very handy to the yards, you can get them in, you can condition score them, weigh them, you can do all that – it's all easy.

So I reckon that you've said, is it's easier to manage to the nutritional requirements that they need

It is.

We've taken out our light twinners, they went on to lucerne after preg scanning, they didn't go into containment, heavy singles, pull them back in condition. Twinners – they've improved out of sight already, they've had no supplementary feeding, empties have gone out to a rougher paddock. We've taken condition off our singles (that were between 3.3 – 3.5). We've got one small mob of singles that are down to 2.7 but we're trying to bring the rest back a bit – so you can do that. It's just handy. And having the extra 4 containment areas this year has made it just easier again. Obviously having that number of animals, water is very critical – good access to water – but you can feed a lot of animals in a very short period of time.

So, the five key reasons to do it.

1. To get adequate levels of pasture for our lambing ewes.
2. Also not knocking pasture on the head when it's trying to get going (grow more grass during winter)
3. Higher stocking levels – we're able to control animal intake far better in the last trimester
4. Convenience – it's a labour saver
5. You know you're not going to have to feed animals during lambing. I've done it before and I hated it with a passion.

Benefits all around. One thing you've got to manage properly and that's the transition from containment to paddock. Twins come out of containment at least a week before the singles. Wouldn't like to have twins in any more than 3 weeks before lambing. Fourth week before lambing is really when I'd like to have them out. Singles can be in one or two weeks more. Can put your twinners out on the singles paddocks and get them down to the level you want them too – that's another management tool.

Triplets don't go into containment – will be shandied through twinning mobs.

2017 host producer

R&F run 2000 ewes in a prime lamb and wool enterprise at Glenthompson, Victoria. They had previously been containing sheep over summer and releasing at the break. The 2016 demonstration and discussions encouraged them to try containing for a longer period to allow FOO to reach around 1400kgDM/ha after the break.

July is our limiting factor to production. We are trying to hold sheep in containment to grow more grass in autumn and potentially run more stock by getting rid of the July factor. The cost analysis will be really important to see that it is worthwhile.

Benefits of the demonstration:

It is evidence based and makes the results believable, which is very different to just hearing something in the pub.

It's not like using a tiny strip of fertiliser- we are seeing this on-farm. Last year parts of the demonstration site got too wet and it made me think that every farm and every situation is different and we need to adapt.

July is our restriction- if we can remove that restriction, it will make a big difference.

The demonstration pulls together all our skills; all that we've learnt in the last 15 years and we use all this knowledge and it refreshes it.

It's a great way to learn around the place- to get people there and share ideas. We are collectively forming a template that will suit most people.

I'm hoping this will give us confidence (in condition) for lambing and lead to better pasture utilisation through the year.

2016 demonstration host

Runs 4000 ewes in a mixed sheep/cropping enterprise at Penshurst, Vic. He was employing a sheep manager in 2016 during the demonstration.

Containment worked for us last year after such a dry spring in 2015.

It's a tool we will use when the season lends itself but we are not doing it this year with the feed around and a good break.

The information we got was great and it was a really good system for that year. It is all building knowledge for us as every year is different. We need to remember what we do for different years and we need to know the triggers for next time- so that we are thinking about a plan early in the season and managing risks.

Feeding in containment is quick and easy and we are set up to use it when we need it. It is good for controlling condition but I wouldn't try to put on weight. We want to make the most of grass and would prefer not to feed if we don't have to - but we are set up well with containment if we need it.

8.3 Appendix 3: ADOPT results

ADOPTReport181113.pdf

8.4 Appendix 3: Factsheet

AutumnSavingsFactsheet.dotx