



# final report

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## Improving the reproductive efficiency of ewe lambs

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## Abstract

The overall aim of this PDS was to improve the reproductive efficiency of ewe lambs in both cross-bred and Merino sheep leading to improvements of at least 10% in flock reproductive performance. Between 2010 and 2012 trials for mating ewe lambs at 7 to 10 months were undertaken on 4 crossbred flocks and 11 merino flocks. It was demonstrated that mating merino and crossbred ewes at 7 to 10 months was an effective way of lifting lamb production by more than 10% in the flocks participating for multiple years in this project. These flocks achieved a 60% conception rate in merino ewe lambs and a 75% conception rate in crossbred ewe lambs. It was found that both the weight and condition score of ewe lambs at joining significantly affected the reproductive rate in both merino and crossbred ewe lambs. In fact the combined analysis of PDS flocks indicated that on average a 1 kg increase in live-weight at joining was associated with a 3.7 and 2.6% increase in reproductive rate (foetuses per 100 ewes joined) for merino and crossbred ewe lambs respectively. There were also significant additional effects of condition score of ewe lambs at joining on reproductive rate, over and above correlated changes in live-weight, suggesting that early maturing ewes achieve higher reproductive performance when mated as ewe lambs. At a given live-weight an extra condition score at joining increased reproductive rate by 31 and 26% for merino and crossbred ewe lambs respectively.

Genetic parameters were also found to significantly affect reproductive rate of both merino and crossbred ewe lambs, albeit one merino and one crossbred flock had ASBV's on the ewe lambs involved in this project. It was found that per one unit increase in post-weaning weight (PWWT) reproductive rate increased by 17% in merinos and 6% in crossbreds. In addition carcass traits in merino ewe lambs were shown to be positively correlated with reproductive rate, where at a given joining live-weight an increase of one unit in post-weaning fat (PFAT) and post-weaning muscle (PEMD) resulted in a 50% and 27% increase in reproductive rate, respectively.

A number of significant barriers and concerns participating producers had to mating and lambing ewe lambs were overcome in this project. Firstly, it was demonstrated that reasonable reproductive rates could be achieved, second that the majority of pregnant ewe lambs were able to lamb down and rear their lambs successfully, and finally that with targeted management these ewes achieved high reproductive rates on their second mating. In addition a ready reckoner was developed that producers could use to determine the break-even marking rate they would need to achieve with varying grain prices and lamb prices. The merino flocks that participated in the PDS for more than one year achieved an average marking rate of 50%, which in the period from 2010 to 2012 of this PDS proved to be economically viable at the prevailing lamb prices and feeding costs.

## Executive Summary

Between 2010 and 2012 trials for mating ewe lambs at 7 to 10 months were undertaken on 4 crossbred flocks and 11 merino flocks. The first objective of the PDS was for 60% of merino and 80% of crossbred ewe lambs that are joined at 7-10 months of age to conceive. For the flocks involved in the PDS for more than one year the outcomes in relation to the first objective were;

- a total of 6,904 crossbred ewe lambs were mated of which 5166 conceived, representing a 75% conception rate, and
- a total of 6,980 merino ewe lambs were mated of which 4124 conceived, representing a 59% conception rate.

Hence the outcome achieved in both crossbred and merino ewe lambs were just under the target set for the PDS, which is an excellent outcome given that mating ewe lambs is not common practice, particularly in merinos.

The second objective of the PDS was to increase the lamb production of flocks in the PDS by 10% through the joining of ewe lambs at 7 to 10 months. For the flocks involved in the PDS for more than one year the outcomes in relation to the second objective were;

- a total of 2,078 extra lambs were produced from crossbred ewe lambs, which represented a 13% (2,078 lambs from ewe lambs / 16,100 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs, and
- a total of 2,099 extra lambs were produced from merino ewe lambs, which represented a 17% (2,099 lambs from ewe lambs / 12,660 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs.

Hence the outcome achieved in both crossbred and merino ewe lambs exceeded the target set for the PDS, and demonstrated that mating ewe lambs at 7 to 10 months is a practical avenue for lifting lamb production by more than 10%.

The third objective of the PDS was for 80% of merino and 90% of crossbred ewes that lambed as ewe lambs to conceive on their second joining. In relation to this objective only one out of the fifteen flocks involved in the PDS observed a reduction in conception rates due to lambing as ewe lambs. In fact the performance of ewes on their second mating was highlighted by the majority of participating merino and crossbred flocks as a very beneficial outcome of lambing as ewe lambs. An example on one flock was the crossbred ewes that reared lambs as ewe lambs scanned 179% on their second mating compared to 167% in the ewes that didn't lamb as a ewe lamb.

Other highlights of lambing ewes at 12 to 15 months of age observed by participating producers was the ease of lambing, mothering ability and the quality of lambs produced of ewe lambs. Although these outcomes were not specifically measured as part of this PDS the observation made by participants are most valuable and encouraging to this endeavour. In contrast, a few participants specifically mentioned the low conception rates achieved in ewe lambs as a disappointment with mating ewe lambs, along with questions about why ewes in good weight/condition still didn't conceive. Some lambing difficulties were also mentioned, particularly in single bearing crossbred ewe lambs. It should be noted that only one PDS participant recognised a reduction in conception rates of ewes that lambed as lambs, on their second mating.

PDS participants were also asked about their intentions for mating ewe lambs in 2013 and all bar one crossbred flock will continue to join ewe lambs in 2013. For the merino flocks, 27% will not join ewe lambs in 2013, and the remainder will join ewe lambs either opportunistically (36%) or routinely in the future (36%). When questioned about whether joining ewe lambs fits their

system, all crossbred believed that mating ewe lambs does fit their system. For the merino flocks, 64% believe it fits their system, while 36% felt it didn't fit their system due to either the high labour requirements of mating ewe lambs or not having a protein source/finishing system. The PDS participants when then asked to highlight any modifications that would be required to help mating ewe lambs fit their system even more so. Clearly a number of PDS participants are intending to lamb their adult ewes earlier so that their ewes lambs will be a month or so older for their first mating. Also the majority of the PDS participants need the ewe lambs to recover quickly from their first lambing so that their next lambing can be brought forward by up to 3 months.

Other key works undertaken in this PDS was to review the current practices and levels of performance achieved when joining ewe lambs and document the perceived barriers to adopting the practice of joining ewe lambs, including a detailed producer case study. This work was undertaken with 120 producers and it was found that less than 5% of Merino producers are joining ewe lambs, with 75% of those producers undertaking the practice having a scanned in lamb % of less than 80%. While more than 50% of crossbred producers are joining ewe lambs, with 70% of those producers undertaking the practice having a scanned in lamb % of less than 80%. Overall 78% of producers surveyed (Merino and crossbred combined) intended to join ewe lambs in the following year.

The biggest concerns held by these producers about joining ewes were not being big enough to join (39%), too many difficulties (22%), not being able to get the ewes back in lamb (13%) and that joining ewe lambs is not economically viable (13%). These barriers were examined in more detail specifically for producers joining Merino ewe lambs at 7-9 months (Figure 1). The biggest concerns held by these producers about joining ewes were not being big enough to join (29%), too many difficulties (18%), not good mothers and wean poor lambs (18%), and that joining ewe lambs is not economically viable (18%).

A case study was undertaken on a producer who has been joining ewe lambs for some time. The case study was conducted on Nigel Kerin from Yoeval in central west New South Wales. Nigel had been joining ewe lambs for 8 years, with varying success. Over that period lambs marked to ewe lambs joined ranged from 53% to 82%, with an average of 70%. Currently this property joins 2,200 ewe lambs annually and instead of visually culling young ewes, the approach taken is to cull the ewe lambs that don't conceive at 7-9 months of age, providing they have been well managed up to joining. The critical success factors observed by Nigel for achieving good reproductive performance in merino ewe lambs include;

- at least condition score 3.0 at joining,
- at least 38kg at joining,
- better results at 8 months plus at joining rather than 7 months,
- body wrinkle score of less than 3, and
- noticed significant sire effects, where even at these targets outlined the daughters of some sires would struggle to get 30% in lamb as a ewe lamb, while others would achieve 95%.

The data generated in the PDS was provided to John Young, Farming Systems Analysis, to undertake a break even analysis using MIDAS. A key objective of this PDS was to determine the break even marking percentages required for ewe lambs to offset the costs associated with getting the ewe lambs to a joinable weight, at varying lamb prices. The value of an extra lamb outlined in Table 26 (fully- stocked farm) and 27 (under-stocked farm) at varying lamb prices, is the gross margin value of an extra lamb taking out the extra costs of pregnancy and lactation. While the extra feeding costs, is the cost of feed invested in the ewe lamb over and above a ration that would deliver the widely recommended growth of 1 kg/month in merino weaners.

The majority of PDS participants require the ewe lamb to recover from a spring lambing in late August/September to a winter lambing in June/July. To date PDS participants have achieved good conception rates on their second mating but are now realising to achieve higher conception

results as a ewe lamb they need to join later, which has resulted in the need for the ewes to then be brought forward on their second mating to match in with the adult flock. The research question is if ewe lambs are well managed on their first lambing, to what degree can the majority (>80%) of the ewes be brought forward significantly (at least 2 months) on their second lambing. A related question that PDS participants had was what difference does every month of age at mating, after 6 months, at the same weight and condition, have on the conception rates of ewe lambs.

The other key question that PDS participants have is why some ewes got in lamb and others didn't, particularly those down as low as 30 kg at joining. The opportunity exists, to revisit the flocks involved in this PDS and measure the mature weight of ewes that were mated as lambs and re-analyse the data based on joining weight as a percentage of mature weight. This may help explain the mating outcome achieved and allow a further refinement of extension messages to producers.

## Background

The sheep industry is facing serious issues which revolve around a flock that has declined to record low levels and varying returns for wool and meat. The situation facing the sheep industry is:

- the national flock has declined to approximately 40 million breeding ewes,
- lamb slaughter rates are approaching 20 million lambs per annum,
- national reproductive rates have remained unchanged at about 80% for many years and
- a much greater proportion of industry income is now made from meat relative to wool, compared to 20 years ago.

Therefore, the challenge of meeting current and future demand for lamb, while sustaining a viable national ewe flock is becoming increasingly difficult. Ewe lambs are a severely under-utilised resource that with improved management practices and genetics could contribute significantly towards increasing weaning rates in the sheep industry. For instance if ewe lambs were to have an average reproduction rate of 60% this would lift overall weaning rates by 15-20%. Currently, only about 10% of ewes are mated as lambs across the national flock. The project aims to investigate the opportunity to improve the reproductive efficiency of ewe lambs in both cross-bred and Merino sheep to help address the situation facing the industry. The limited number of producers that are joining first cross and composite ewe lambs are achieving varied success and very few merino breeders are joining ewe lambs. The project aims to improve the reproductive efficiency of ewe lambs in circumstances where they are already being joined as lambs (some cross-bred flocks) and to demonstrate what is possible in Merino flocks.

For every 1000 ewes in a flock there needs to be around 200 ewe lambs available as replacements. If the flock currently lambs at 80% there will be 800 lambs per 1000 ewes. If we join the 200 ewe lamb replacement and achieve a 60% lambing that's an extra 120 lambs or an increase in the overall reproduction rate of 15%. Hence one of the project objectives is to increase the lamb production of flocks in the PDS by at least 10% through the joining of ewe lambs at 7 to 10 months.



## Project Objectives

The overall aims of this PDS are to improve the reproductive efficiency of ewe lambs (lambing at 12-15 months) in both cross-bred and Merino sheep leading to improvements of at least 10% in flock reproductive performance.

The objectives of this PDS are:

1. For 60% of merino and 80% of crossbred ewe lambs that are joined at 7-10 months of age in the PDS to conceive.
2. To increase the lamb production of flocks in the PDS by 10% through the joining of ewe lambs at 7 to 10 months.
3. For 80% of merino and 90% of crossbred ewes that lambed as ewe lambs to conceive on their second joining.
4. To develop best practice management guidelines for improving the reproductive performance of ewe lambs.

Key works that will be undertaken to achieve these objectives, that are detailed in the methodology include;

- To review the current practices and level of performance achieved when joining ewe lambs, and document the perceived barriers to adopting the practice of joining ewe lambs, including a detailed producer case study.
- Undertake trials on 15 properties, comprising of 4 cross-bred flocks and 11 merino flocks, between 2010 and 2012 to develop best practice management guidelines for improving the reproductive performance of ewe lambs in both their first and second lambing that builds on the '45x7 – Joining ewe lambs for more profit, Tips & Tool document'.
- To calculate the benefit:cost of joining ewe lambs and identify the break even weaning percentage to cover the extra costs associated with preparing ewe lambs for mating, at varying grain and lamb prices.





## Methodology

The first stage of the PDS involved reviewing the current management practices and performance achieved by producers who are joining ewe lambs, both cross-bred and if possible merino flocks. Concurrently producers from within the BWBL network were used to identify the perceived barriers to adopting the practice of joining ewe lambs, which may be different for the different breeds. The aim of this work was to identify the likely stumbling blocks for producers to lambing ewe lambs at 12-15 months of age, particularly Merinos.

A detailed case study was also undertaken of a producer in New South Wales who has been successfully lambing Merinos as ewe lambs for several years. Due to the lack of Merino enterprises lambing at 12-15 months this case study will provide a useful insight into what can be achieved and some of the critical success factors.

A key component of the works outlined above is to identify the skills that are critical to being able to effectively manage ewe lamb joining and subsequent lambing. These skills will be developed among participating producers through training workshops and will also form the basis of a skills audit to be undertaken with participating producers.

The major component of the PDS involved trialling ewe lamb mating in both crossbred and merino flocks. The aim will be to improve the performance of crossbred and merino ewe lambs so that 80% of crossbred and 60% of merino ewe lambs that are joined at 7-10 months of age conceive.

Ewe lamb mating was trialled on 15 properties between 2010 and 2012, involving 4 crossbred flocks and 11 merino flocks. Ewe lambs were joined at weights ranging from 20 to 70 kg and between 7 to 10 months of age, with the resulting conception and weaning percentages recorded. At each site the ewe lambs to be mated were tagged with RFID tags, weighed and condition scored at the point of joining and individual pregnancy scanning results recorded. Mob based lamb marking percentages were also collected for each site. Participating properties were also requested to observe and record any compromises in second mating conception rates, as a result of lambing as ewe lambs.

The information collected from the PDS trial sites will be used to develop best practice management guidelines, along with existing information such as the '45x7 – Joining ewe lambs for more profit, Tips & Tool document'. Developing the guidelines will involve identifying the required weight and maturity of Merino and cross-bred lambs for successful joining and lambing.

A benefit:cost analysis will be calculated, with a particular focus on break even marking percentage required at different lamb price and feed costs. This analysis will be undertaken for the first time by July 2011 and then validated by December 2012 and a summary table included in the final report.

The producers involved in this PDS will undertake training and skill development to implement the best management practice guidelines for improved reproductive performance of ewe lambs. This will occur throughout the PDS, particularly in July 2010 and July 2011 prior to the expansion of the trial flocks involved in the second and third year. The basis to this training will be the principles and practices outlined in Lifetime Ewe Management. Recommendations for the training required to effectively implement the guidelines will form part of the final version of the best practice management guidelines completed by December 2012. Included in the final report will be the results of a skills audit undertaken on participating producers to review the development of key skills such as pasture and animal assessment, feed budgeting and completing a cost-benefit analysis, and provide an outline of how these skills will benefit their business in the longer term.

The trial outcomes will be extended throughout the BWBL network and to the broader sheep industry. The BWBL network is ideally placed to provide maximum exposure of the trial outcomes through on-farm field days, producer group discussion, annual conference, Stock and Land articles, newsflash updates and newsletters

## Results and discussion

### 1.1 Barriers to adoption

This work was undertaken with 120 producers. Less than 5% of Merino producers are joining ewe lambs, with 75% of those producers undertaking the practice having a scanned in lamb % of less than 80%. While more than 50% of crossbred producers are joining ewe lambs, with 70% of those producers undertaking the practice having a scanned in lamb % of less than 80%.

Overall 78% of producers surveyed (Merino and crossbred combined) intend to joining ewe lambs next year. The biggest concerns held by these producers about joining ewes were not being big enough to join (39%), too many difficulties (22%), not being able to get the ewes back in lamb (13%) and that joining ewe lambs is not economically viable (13%).

These barriers were examined in more detail specifically for producers joining Merino ewe lambs at 7-9 months (Figure 1). The biggest concerns held by these producers about joining ewes were not being big enough to join (29%), too many difficulties (18%), not good mothers and wean poor lambs (18%), and that joining ewe lambs is not economically viable (18%).



**Figure 1. Barriers to joining merino ewe lambs**

### 1.2 Producer case study

A case study was undertaken on a producer who has been joining ewe lambs for some time. The case study was conducted on Nigel Kerin from Yoeval in central west New South Wales. Nigel had been joining ewe lambs for 8 years, with varying success. Over that period lambs marked to ewe lambs joined ranged from 53% to 82%, with an average of 70%. Currently this property joins 2,200 ewe lambs annually and instead of visually culling young ewes, the approach now taken is to cull the ewe lambs that don't conceive at 7-9 months of age, providing they have been well managed up to joining.

The critical success factors observed by Nigel for achieving good reproductive performance in merino ewe lambs include;

- At least condition score 3.0 at joining,
- At least 38kg at joining,
- Better results at 8 months plus at joining rather than 7 months,
- Body wrinkle score of less than 3,

- Noticed significant sire effects, where even at these targets outlined the daughters of some sires would struggle to get 30% in lamb as a ewe lamb, while others would achieve 95%.

### 1.3 Ewe lamb mating trials 2010 to 2012

Ewe lamb mating trials were undertaken on 15 properties, comprising of 4 crossbred flocks and 11 merino flocks, between 2010 and 2012. Initially 6 flocks were involved in 2010, comprising of 2 crossbred and 4 merino flocks and the results achieved are outlined in Tables 1 and 2, respectively.

**Table 1. Crossbred flocks for 2010 joining**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Hayes	8	400	222	106	63	42	58	140	35	35 (25-45)	2.6 (1.7-3.3)
Peddie	8	1641	336	580	725	80	124	1081	66	43 (25-65)	3.3 (2.3-4.0)

There was substantial difference in the weight and condition score of the two crossbred flocks at joining, and this was reflected in their conception rates, where one scanned 124% which was more than double the other flock.

**Table 2. Merino flocks for 2010 joining**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Dookie College	7	450	434	12	0	3	3	7	2	33 (21-54)	2.8 (2.3-3.3)
Duxson	8	412	335	65	12	19	22	65	16	37 (27-46)	2.9 (2.5-3.5)
McGregor	7	252	95	85	72	62	91	165	65	43 (33-55)	3.0 (2.6-3.5)
De Fegley	8	330	192	98	40	42	54	80	24	35 (27-44)	2.8 (2.3-3.3)
<b>Total</b>		<b>1444</b>						<b>317</b>	<b>27</b>		

There was substantial difference in the weight and condition score of merino ewe lambs at joining, and this was reflected in their conception rates, where the heaviest ewe lambs scanned 91% compared to the lightest ewe lambs which scanned only 3%.

The number of crossbred flocks participating expanded to three in 2011. The results are summarised in Table 3, with each of the flocks achieving the target of 80% ewe lambs pregnant.

**Table 3. Crossbred flocks for 2011 joining**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Hayes	8	979	198	535	246	80	105	862	88	40 (27-53)	3.0 (2.0-3.7)
Peddie	8	1612	200	712	700	88	131	1447	90	45 (28-63)	3.2 (2.0-4.0)
Leeming	7.5	316	61	89	153	81	137	320	101	51 (35-69)	3.5 (3.0-4.0)
<b>Total</b>		<b>2907</b>						<b>2629</b>	<b>93</b>		

The number of merino flocks participating expanded to six in 2011. The results are summarised in Table 4 and with the exception of one flock all participants got over 50% of ewe lambs pregnant.

**Table 4. Merino flocks for 2011 joining**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Duxson	8	935	433	421	81	54	62	470	50	41 (33-49)	3.3 (2.7-4.0)
McGregor	7	350	136	190	24	56	68	182	52	39 (28-51)	3.3 (2.5-3.7)
Hooke	8	718	313	285	120	56	73	380	53	44 (32-61)	3.1 (2.5-3.7)
Wall	8.5	268	58	176	34	78	91	164	61	44 (30-66)	2.9 (2.0-3.5)
Roberston	9	173	57	91	25	67	82	112	65	48 (33-61)	3.2 (2.5-3.7)
Pitcher	8.5	240	184	45	11	23	28	50	21	41 (32-56)	3.3 (2.8-4.0)
<b>Total</b>		<b>2684</b>						<b>1358</b>	<b>51</b>		

Although the three crossbred flocks involved in 2012 had similar joining weights and condition score their overall scanning percentages varied significantly from 122% down to 64% (Table 5). It should be noted that the flock that achieved the highest scanning percentage joined their ewes two months older than the other flocks.

**Table 5. Crossbred flocks for 2012 joining**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Hayes	8	614	197	334	83	68	81	325	53	39 (25-53)	3.0 (2.0-3.7)
Floyd	10	450	50	250	150	88	122	386	85	42 (30-60)	3.1 (2.0-3.7)
Leeming	7.5	892	452	308	132	49	64	450	50	38 (27-55)	3.0 (2.0-3.7)
<b>Total</b>		<b>1956</b>						<b>1161</b>	<b>63</b>		

By the end of the PDS all four crossbred flocks that participated had achieved the target set of 80% pregnancy in mated ewe lambs in at least one of the years they were involved.

The number of merino flocks participating expanded to eight in 2012. The results are summarised in Table 6.

**Table 6. Merino flocks for 2012 joining**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Duxson	8	974	394	413	167	60	77	370	38	43 (34-61)	3.2 (2.5-3.5)
McGregor	7	739	274	353	112	63	78	435	75	36 (25-54)	3.1 (2.3-3.7)
Hooke	8	1095	416	489	190	62	79	569	52	45 (34-62)	3.2 (2.5-3.7)
Wall	8.5	389	99	229	61	75	85	261	67	44 (28-59)	3.1 (2.0-3.5)
Roberston	8.5	680	540	130	10	21	22	102	15	34 (22-51)	2.8 (2.0-3.5)
Kubeil	7	444	382	49	13	14	17	50	11	39 (27-54)	3.1 (2.0-3.7)
Gibbs	8	484	445	39	0	8	8	25	5	34 (20-45)	2.8 (1.7-3.5)
Dean	8.5	384	95	232	57	75	88	242	63	38 (22-61)	3.1 (2.5-3.7)
<b>Total</b>		<b>5189</b>						<b>2054</b>	<b>41</b>		

By the end of the PDS 6 of the merino flocks that participated had achieved the target set of 60% pregnancy in mated ewe lambs in at least one of the years they were involved. The 5 remaining flocks only participated for one year each and achieved less than 60% pregnant in mated ewe lambs.

## 1.4 Crossbred flocks summary

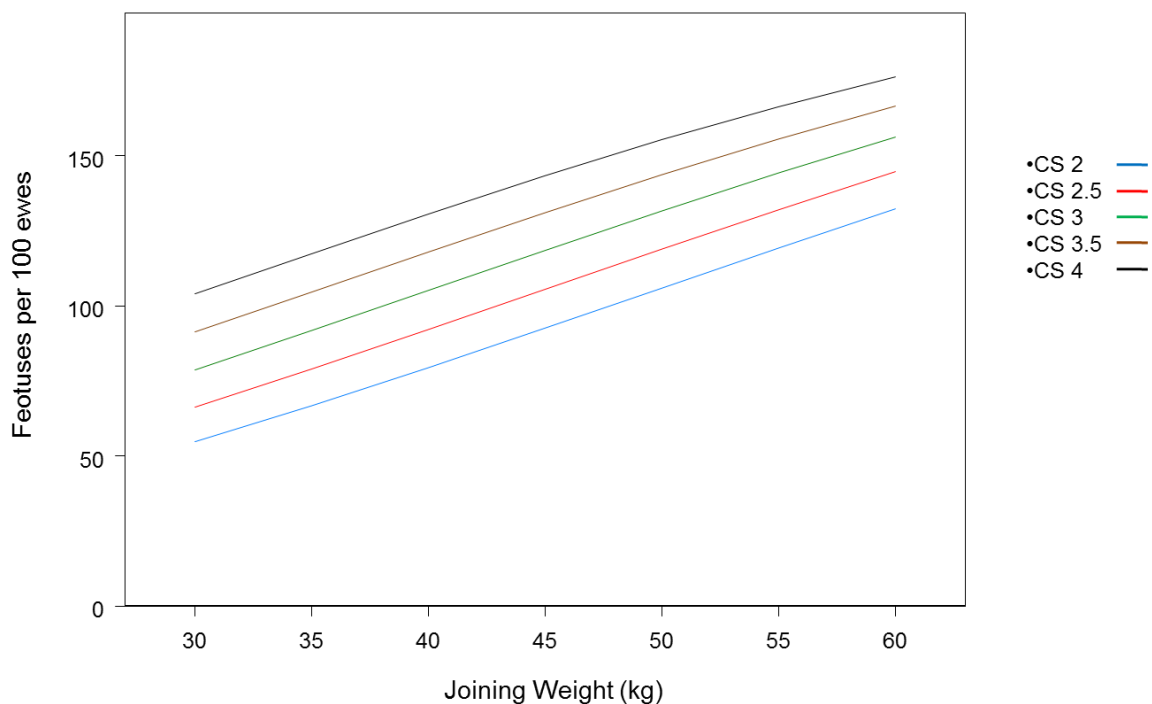
### 1.4.1 Hayes flock

The Hayes family run a self-replacing composite lamb enterprise at Violet Town in north east Victoria. The PDS trial was Hayes's first attempt at joining ewe lambs and their results are outlined in Table 7.

**Table 7. Summary of Hayes flock results for 2010, 2011 and 2012**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
2010	8	400	222	106	63	42	58	140	35	35 (25-45)	2.6 (1.7-3.3)
2011	8	979	198	535	246	80	105	862	88	40 (27-53)	3.0 (2.0-3.7)
2012	8	614	197	334	83	68	81	325	53	39 (25-53)	3.0 (2.0-3.7)
<b>Total</b>		<b>1993</b>						<b>1327</b>	<b>59</b>		

The average outcome achieved over the 3 years in extra lambs marked represents a 15% (averaged 442 lambs from ewe lambs / 3000 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition on ewe lamb conception rates for the Hayes flock is depicted in Figure 2.



**Figure 2. Impact of joining weight and condition on conception rate of Hayes composite ewe lambs**

**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
  - very interesting,
  - joined too long, and
  - ran singles on good feed for too long approaching lambing- pulled lambs.
- (b) The good (surprising) points;
  - that it can be done, and
  - some ewe lambs joined much lighter than expected.
- (c) The disappointing aspects;
  - dystocia in singles, and
  - loss of some ewe lambs.
- (d) Fit within your system and refinements required;
  - Yes- but need to get the ewe lamb in lamb in March rather than April.
- (e) Plans for the future, including 2013;
  - won't join any this year because its' too dry and grain too dear.
- (f) Questions that require further investigation;
  - recovery from a September lambing to a July lambing as a 2 year old, also
  - the impact of pulling them back in joining (ie. less recovery time) on twinning rates, and
  - some ewe lambs joined much lighter than expected- why?.

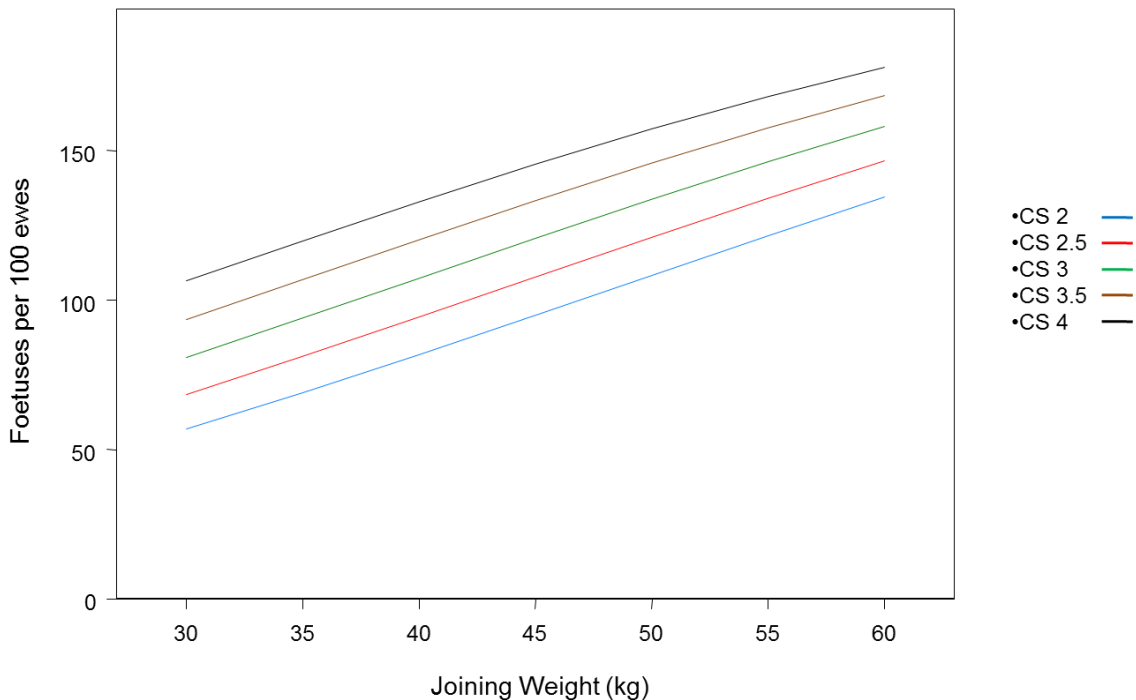
### 1.4.2 Peddie flock

The Peddie family run a self-replacing composite lamb enterprise at Peshurst in south west Victoria. Prior to the PDS trial the Peddie’s had attempted joining the top 500 of their ewe lambs with varying success from 60 to 93% fetuses scanned to ewe lambs joined. Their results achieved in the PDS trial in 2010 and 2011 are in Table 8. Peddie’s were unable to participate in the trial in 2012 due to the ewe lambs being sent off on agistment.

**Table 8. Summary of Peddie flock results for 2010 and 2011**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
2010	8	1641	336	580	725	80	124	1081	66	43 (25-65)	3.3 (2.3-4.0)
2011	8	1612	200	712	700	88	131	1447	90	45 (28-63)	3.2 (2.0-4.0)
	<b>Total</b>	<b>3253</b>						<b>2528</b>	<b>78</b>		

In the PDS trial Peddie’s produced an average on 800 extra lambs from ewe lambs than previous, which represents a 14% (800 lambs from ewe lambs / 5800 lambs from adult ewes) increase in lamb production as a result of mating more ewe lambs and achieving better results with ewe lambs. The impact of joining weight and condition on ewe lamb conception rates for the Peddie flock is depicted in Figure 3.



**Figure 3. Impact of joining weight and condition on conception rate of Peddie composite ewe lambs**



**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
  - requires a high level of management,
  - if you focus on it results will improve, particularly how they perform on second joining, but
  - don't go into it with too high expectations.
- (b) The good (surprising) points;
  - good quality lambs off ewe lambs, and
  - performed very well on second lambing- scanned 179% in lamb with 3 week mating.
- (c) The disappointing aspects;
  - lost my discipline with high lamb prices- joined for too long, which has led to small lambs and poor ewes at weaning.
- (d) Fit within your system and refinements required;
  - Yes- it is crucial to our system, but
  - Need strategies with late spring management if the season closes in.
- (e) Plans for the future, including 2013;
  - we will join 800 at least but could join up to 1500 in 2013.
- (f) Questions that require further investigation;
  - dystocia in single bearing ewe lambs and prolapse,
  - impact of increased weight gain during pregnancy,
  - what triggers low weight ewe lambs to get in lamb- some joined down to 30kg, and
  - effects on longevity.

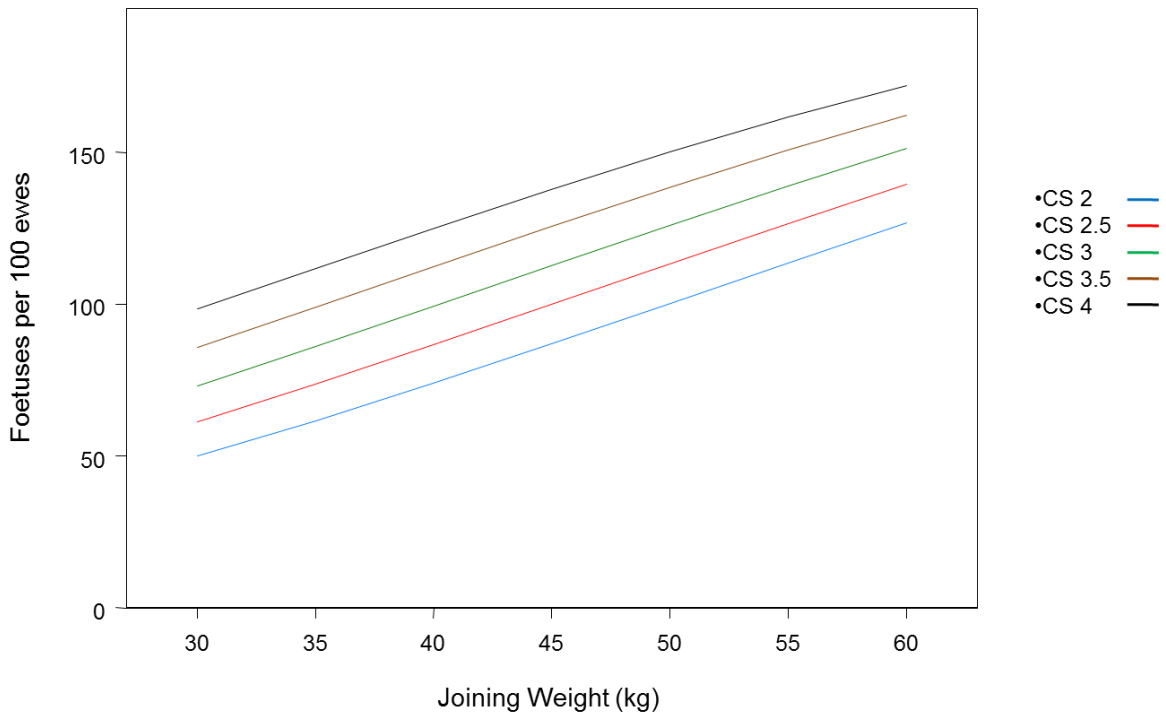
### 1.4.3 Leeming flock

The Leeming family run a self-replacing composite lamb enterprise at Balmoral in western Victoria. The PDS trial was Leeming's first attempt at joining ewe lambs and their results are summarised in Table 9.

**Table 9. Summary of Leeming flock results for 2011 and 2012**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
2011	7.5	316	61	89	153	81	137	320	101	51 (35-69)	3.5 (3.0-4.0)
2012	7.5	892	452	308	132	49	64	450	50	38 (27-55)	3.0 (2.0-3.7)
	<b>Total</b>	<b>1208</b>						<b>770</b>	<b>76</b>		

The outcome achieved in 2012 represented a 10% (450 lambs from ewe lambs / 4500 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition score on ewe lamb conception rates for the Leeming flock is depicted in Figure 4.



**Figure 4. Impact of joining weight and condition on conception rate of Leeming composite ewe lambs**

**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
  - very worthwhile but seasonally impacted,
  - getting up to weight and condition for joining and lambing requires a focussed effort, and
  - need to look at results over a 5 year average.
- (b) The good (surprising) points;
  - having a goal for young ewes- managing to targets and outcomes, and
  - making the ewe a much better article at 2 years of age.
- (c) The disappointing aspects;
  - seasonally impacted, due to
  - the economics when grain expensive affects the cost effectiveness of achieving targets.
- (d) Fit within your system and refinements required;
  - Yes- need to join at 8 months rather than 7 months,
  - have to bring them back from August/September first lamb to July as a 2 year old, therefore
  - must wean early and get good ewe recovery.
- (e) Plans for the future, including 2013;
  - will mate 1400 out of 1800, already greater than 38kg.
- (f) Questions that require further investigation;
  - what triggers low weight ewe lambs to get in lamb- need to measure them as adults, and
  - the role of teasers.

Each of the flocks summarised above had sufficient data to undertake statistical analysis, and for each individual flock ewe lamb weight and condition score at joining were found to significantly ( $p < 0.01$ ) affect the conception rate, in both crossbred and merino ewe lambs mated between 7 to 10 months of age. The remaining crossbred flock, over the page, had insufficient data for statistical analysis but still provided feedback on the process of mating and lambing ewe lambs.

#### 1.4.4 Floyd flock

The Floyd family run a self-replacing crossbred flock at Glenrowan in north east Victoria. The PDS trial was their third attempt at joining ewe lambs and their results are summarised in Table 10.

**Table 10. Summary of Floyd flock results for 2012**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Floyd	10	450	50	250	150	88	122	386	85	42 (30-60)	3.1 (2.0-3.7)

The outcome achieved in 2012 represented a 14% (386 lambs from ewe lambs / 2800 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs.

#### Feedback on mating and lambing ewe lambs:

- (a) Their experience with mating and lambing down ewe lambs;
  - getting better as we go- striving to get to 100% lambs marked to ewe joined, not there yet.
- (b) The good (surprising) points;
  - good mothers and really easy lambing,
  - genetic turnover, and
  - performance as 2 and 3 year olds- they are our best ewes.
- (c) The disappointing aspects;
  - very difficult to get a significant number in lamb joining prior to mid-March.
- (d) Fit within your system and refinements required;
  - Yes- essential in our crossbred operation,
  - joining at 9 to 10 months is delivering much better results than 7 to 8 months, but
  - have to bring them back from September lambing to June the next year.
- (e) Plans for the future, including 2013;
  - joining about 400 in 2013- sticking with our annual number regardless of season and price.
- (f) Questions that require further investigation;
  - how far can we pull them back from first lambing in September to second lambing in June,
  - what triggers low weight ewe lambs to get in lamb.

## 1.5 Merino flocks summary

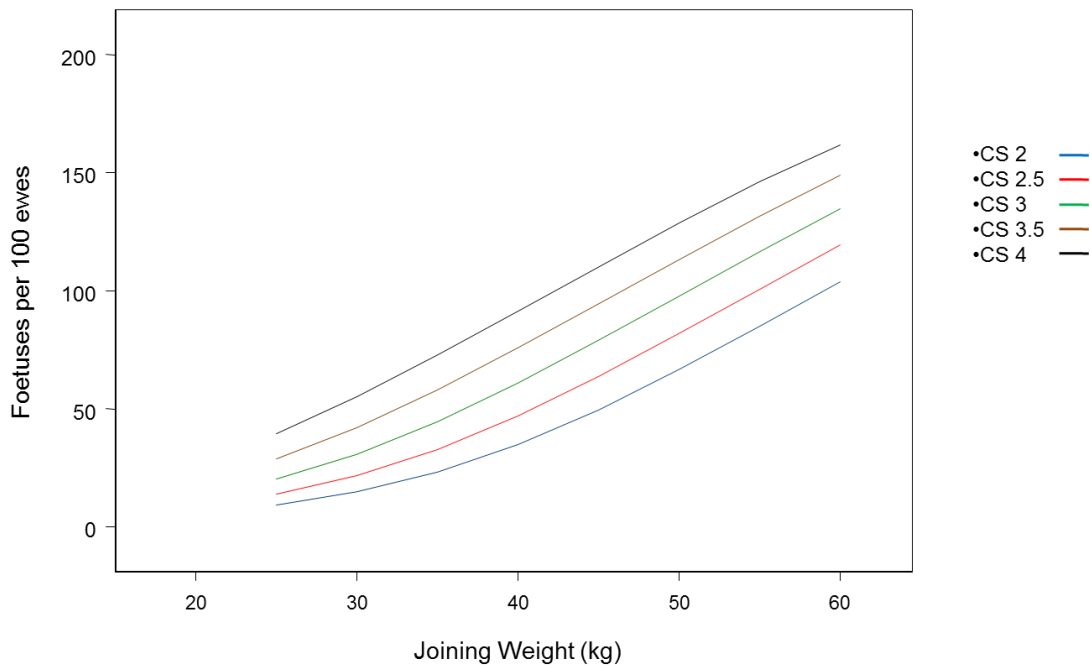
### 1.5.1 Duxson flock

The Duxson family run a dual purpose merino enterprise at Marnoo in western Victoria. The PDS trial was Duxson's first attempt at joining ewe lambs and their results are summarised in Table 11.

**Table 11. Summary of Duxson flock results for 2010, 2011 and 2012**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining	
2010	8	412	335	65	12	19	22	65	16	37 (27-46)	2.9 (2.5-3.5)	
2011	8	935	433	421	81	54	62	470	50	41 (33-49)	3.3 (2.7-4.0)	
2012	8	974	394	413	167	60	77	370	38	43 (34-61)	3.2 (2.5-3.5)	
<b>Total</b>		<b>2321</b>							<b>905</b>	<b>35</b>		

The outcome achieved in 2011 represented a 17% (470 lambs from ewe lambs / 2730 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition on ewe lamb conception rates for the Duxson flock is depicted in Figure 5.



**Figure 5. Impact of joining weight and condition on conception rate of Duxson merino ewe lambs**



**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
  - like it- big part of what we do,
  - need everything going right and need responsive sheep, and
  - marking to weaning to post weaning- keep them going the whole way.
- (b) The good (surprising) points;
  - biggest surprise is the maturity the ewe takes on just before lambing,
  - no handicap on them as a result of lambing as ewe lambs,
  - lamb down easily, and
  - great mothers.
- (c) The disappointing aspects;
  - need high conception rates, but
  - a challenge having twins and rearing them well.
- (d) Fit within your system and refinements required;
  - Yes- my management is the limitation,
  - joining adults for 3 weeks only, which will result in older ewe lambs, then
  - need to recover back from an August/September lamb to July lambing as a 2 year old,
  - must wean lambs at 10 weeks of age off the ewe lambs.
- (e) Plans for the future, including 2013;
  - draft off the tops and mate them in 2013,
  - in future we want as many ewe lambs to conceive as possible- we have shortened adult lambing to 3 weeks to provide older ewe lambs.
- (f) Questions that require further investigation;
  - verify the right combination of nutrition, genetics and age to deliver high conception rates.
  - recovery from August/September lambing to July lambing as a 2 year old.

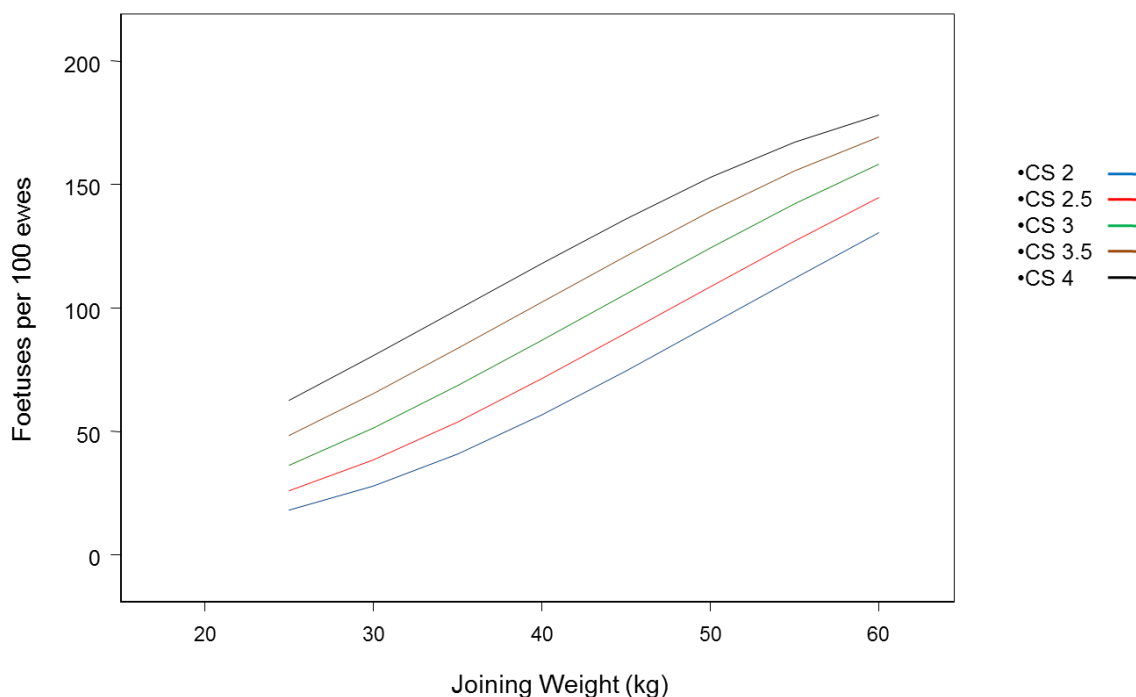
### 1.5.2 McGregor flock

Jock and Maree McGregor run a dual purpose merino flock and broad acre cropping enterprises at Callawadda in western Victoria on 2400ha. The PDS trial was McGregor's first attempt at joining ewe lambs and their results are summarised in Table 12.

**Table 12. Summary of McGregor flock results for 2010, 2011 and 2012**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
2010	7	252	95	85	72	62	91	165	65	43 (33-55)	3.0 (2.6-3.5)
2011	7	350	136	190	24	56	68	182	52	39 (28-51)	3.3 (2.5-3.7)
2012	7	739	274	353	112	63	78	435	75	36 (25-54)	3.1 (2.3-3.7)
<b>Total</b>		<b>1341</b>						<b>782</b>	<b>64</b>		

The outcome achieved in 2012 represented a 32% (435 lambs from ewe lambs / 1380 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition score on ewe lamb conception rates for the McGregor flock is depicted in Figure 6.



**Figure 6. Impact of joining weight and condition on conception rate of McGregor merino ewe lambs**



**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
  - more intensive- particularly in work load and nutrition of young ewes,
  - must get the size and maturity into the ewe lambs, and
  - appears very costly in the current climate.
- (b) The good (surprising) points;
  - ease of lambing- would have been lucky to have assisted 6 ewes over 3 years,
  - didn't stunt the ewe's adult size, and
  - increased fertility at 2 years old (160% plus pregnancy scanning).
- (c) The disappointing aspects;
  - 6 to 8 ewe lambs prolapsed, and
  - the time involved.
- (d) Fit within your system and refinements required;
  - No currently- due to lack of man power, but
  - Yes- just another mob of lambing ewes, and
  - it is a great way to get your ewe numbers up.
- (e) Plans for the future, including 2013;
  - not going to join ewe lambs in 2013,
  - question cost-benefit at the moment, but
  - has been very effective and will most likely do again in the future.
- (f) Questions that require further investigation;
  - effects on their longevity.

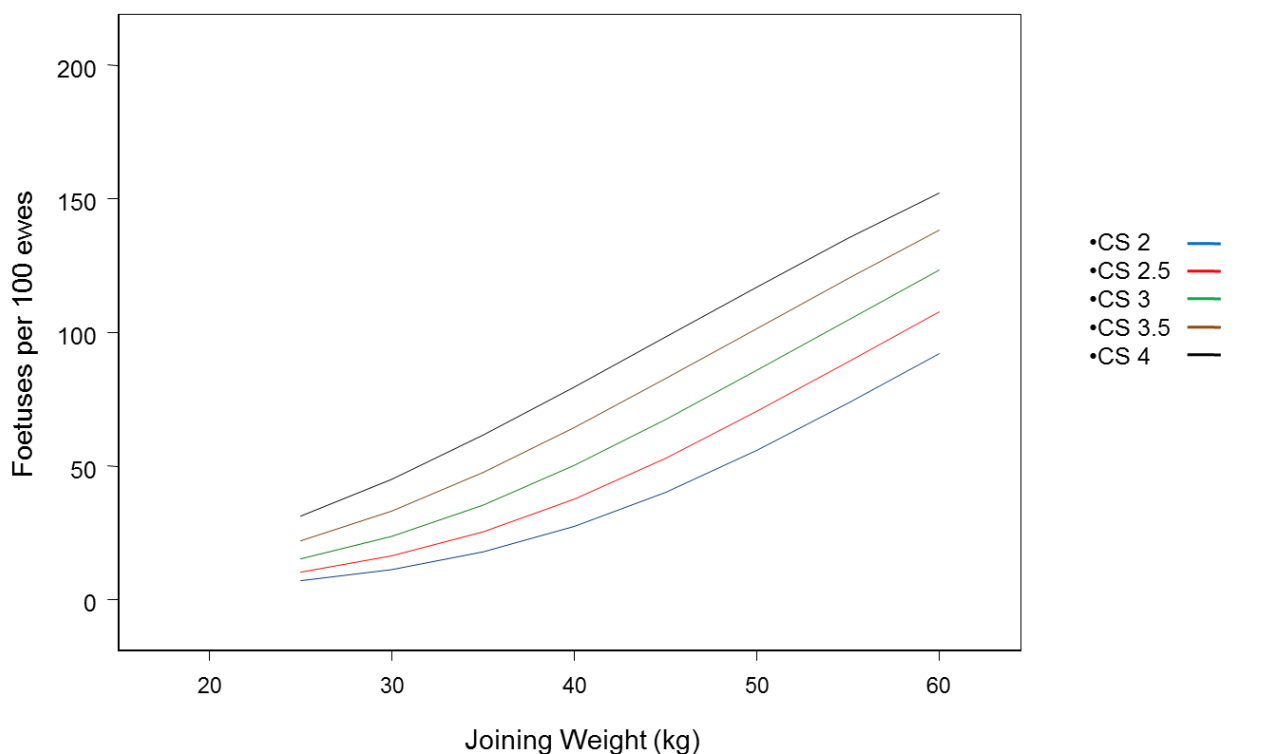
### 1.5.3 Hooke flock

The Hooke family run a dual purpose merino flock and broad acre cropping enterprises at Serpentine in central Victoria. The PDS trial was Hooke’s first attempt at joining ewe lambs and their results are summarised in Table 13.

**Table 13. Summary of Hooke flock results for 2011 and 2012**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
2011	8	718	313	285	120	56	73	380	53	44 (32-61)	3.1 (2.5-3.7)
2012	8	1095	416	489	190	62	79	569	52	45 (34-62)	3.2 (2.5-3.7)
	<b>Total</b>	<b>1813</b>						<b>949</b>	<b>53</b>		

The outcome achieved in 2012 represented a 14% (569 lambs from ewe lambs / 4000 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition on ewe lamb conception rates for the Hooke flock is depicted in Figure 7.



**Figure 7. Impact of joining weight and condition on conception rate of Hooke merino ewe lambs**

**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
- nutrition of ewe lambs needs to be spot on- feed them properly from birth,
  - need high quality pasture plus grain, and
  - things got better as we went and learnt how to do it- we really enjoyed and achieved both dollar and genetic gain.
- (b) The good (surprising) points;
- genetics of ewes that join up,
  - really ramps up our genetic gain and selects ewes that have early growth,
  - joining the ewe lambs nearly classed them- it selected out the style of sheep we want, with the pregnant ewe lambs then only being culled at 20% on visual classing, whereas the dry ewe lambs were culled at 50%, and
  - getting good recovery and results on second joining.
- (c) The disappointing aspects;
- not have whole drop running as dry hoggets to class and sell the culls in spring sales.
- (d) Fit within your system and refinements required;
- Yes- we need to class the ewe lambs at 8 months before we join, and
  - prefer more of them to lamb in June as adults so to fit the system we need good recovery from spring lambing as a ewe lamb.
- (e) Plans for the future, including 2013;
- current feeding and joining ewe lambs- we are confident there is still value in it,
  - we have drafted off the top 1350 in Serpentine and the top 1040 in NSW and joined.
- (f) Questions that require further investigation;
- feed requirements and management 6 weeks pre-lambing and throughout lactation.

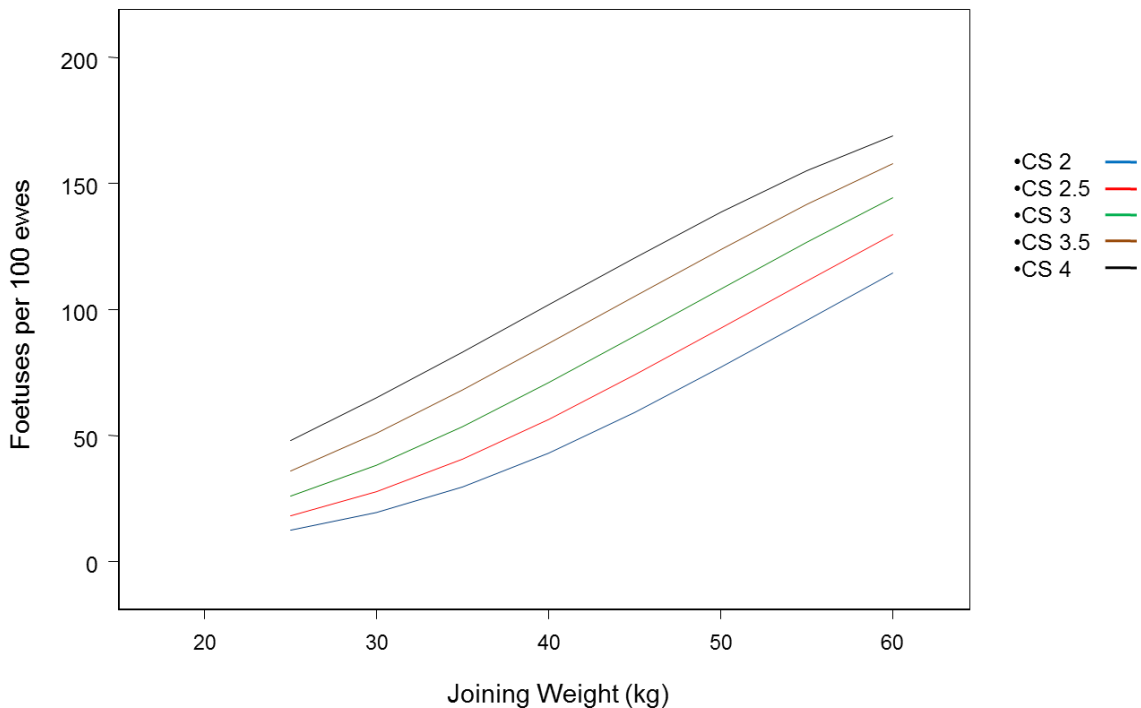
### 1.5.4 Wall flock

The Wall family run a dual purpose merino flock and broad acre cropping enterprises at Serpentine in central Victoria. The PDS trial was Wall's first attempt at joining ewe lambs and their results are summarised in Table 14.

**Table 14. Summary of Wall flock results for 2011 and 2012**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining	
2011	8.5	268	58	176	34	78	91	164	61	44 (30-66)	2.9 (2.0-3.5)	
2012	8.5	389	99	229	61	75	85	261	67	44 (28-59)	3.1 (2.0-3.5)	
<b>Total</b>		<b>657</b>							<b>425</b>	<b>64</b>		

The outcome achieved in 2012 represented a 17% (261 lambs from ewe lambs / 1500 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition on ewe lamb conception rates for the Wall flock is depicted in Figure 8.



**Figure 8. Impact of joining weight and condition on conception rate of Wall merino ewe lambs**

**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
- I think it's a win-win situation- last years' ewe lambs that lambed recovered really well and with good nutrition there was no check,
  - I managed my young ewe better now because I am much more focussed, and
  - lambing ewe lambs is a great tool for rebuilding quickly- its an option, just try the top third.
- (b) The good (surprising) points;
- how well the ewes develop and grow out even having a lamb as a ewe lamb,
  - much quicker genetic turnover- all our breeding ewes are now less than 5 years old, and
  - quietness of the ewe lambs- they make excellent mothers and having a lamb appears to quieten them down a lot.
- (c) The disappointing aspects;
- had to wean their lambs very young, so the lambs were a bit stunted, and
  - 17% were dry on the second joining.
- (d) Fit within your system and refinements required;
- Yes- have to balance ewe recovery versus early weaning the lamb.
- (e) Plans for the future, including 2013;
- not joining this year because its too dry,
  - we are removing all wethers so that we can go all ewes- ewe lambs are a big part of that.
- (f) Questions that require further investigation;
- balance between early weaning the lamb and ewe recovery.

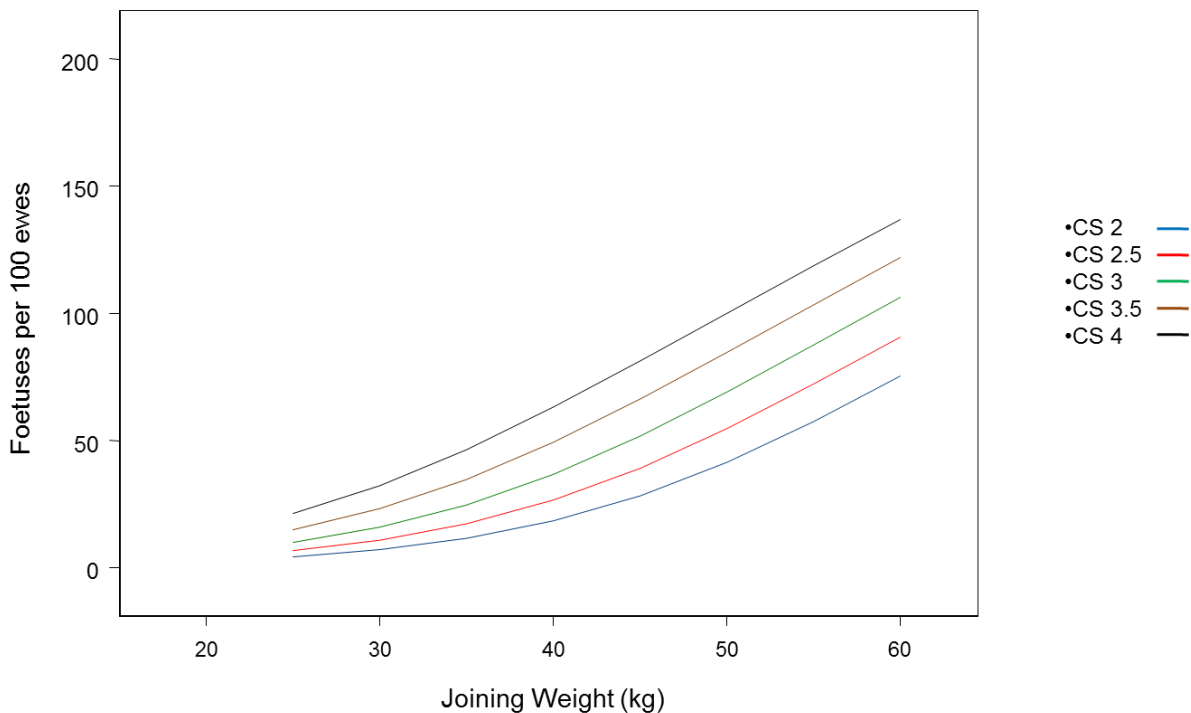
### 1.5.5 Robertson flock

The Robertson family run a dual purpose merino enterprise at Bairnsdale in Gippsland. The PDS trial was Robertson’s first attempt at joining ewe lambs and their results are summarised in Table 15.

**Table 15. Summary of Robertson flock results for 2011 and 2012**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining	
2011	9	173	57	91	25	67	82	112	65	48 (33-61)	3.2 (2.5-3.7)	
2012	8	680	540	130	10	21	22	102	15	34 (22-51)	2.8 (2.0-3.5)	
<b>Total</b>		<b>853</b>						<b>214</b>	<b>40</b>			

The outcome achieved in 2012 represented a 5% (102 lambs from ewe lambs / 2000 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition on ewe lamb conception rates for the Robertson flock is depicted in Figure 9.



**Figure 9. Impact of joining weight and condition on conception rate of Robertson merino ewe lambs**

**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
  - found it very interesting and challenging- getting them up,
  - learnt that body weight and condition score so critical, and
  - it is a challenge in our climate.
- (b) The good (surprising) points;
  - body weight and condition score didn't explain all the joining outcome.
- (c) The disappointing aspects;
  - good looking ewe lambs that didn't get in lamb.
- (d) Fit within your system and refinements required;
  - Yes- in right season it does fit, you need high protein feed, but
  - No- in tough years.
- (e) Plans for the future, including 2013;
  - the early drop ewe lambs we will join in 2013,
  - each year I will weigh it up- definitely do it if the ewes lambs are right.
- (f) Questions that require further investigation;
  - whether certain bloodlines/genetics are more responsive,
  - why is it much easier north of the divide- what can be done south of the divide?.

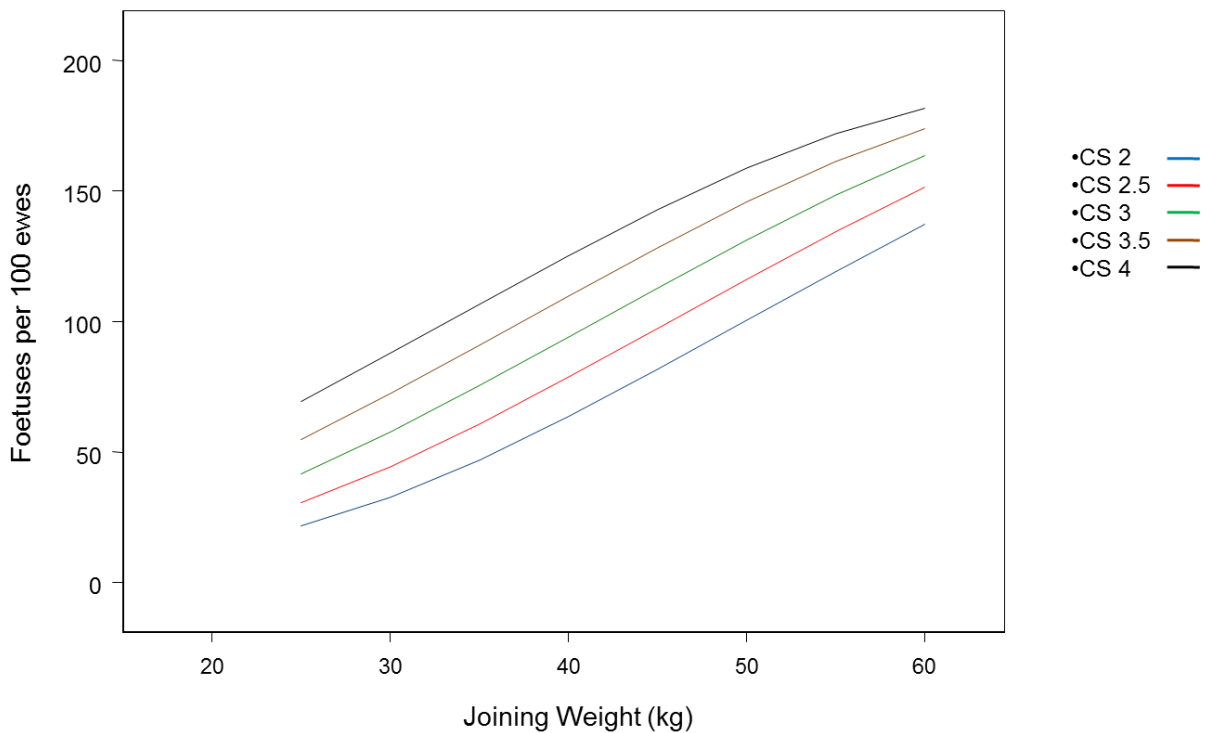
**1.5.6 Dean flock**

The Dean family run a dual purpose merino enterprise at Joel Joel in western Victoria. The PDS trial was Dean’s first attempt at joining ewe lambs and their results are summarised in Table 16.

**Table 16. Summary of Dean flock results for 2012**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
2012	8.5	384	95	232	57	75	88	242	63	38 (22-61)	3.1 (2.5-3.7)

The outcome achieved in 2012 represented a 23% (242 lambs from ewe lambs / 1050 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition on ewe lamb conception rates for the Dean flock is depicted in Figure 10.



**Figure 10. Impact of joining weight and condition on conception rate of Dean merino ewe lambs**



**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
  - definitely got its' merits, but
  - certainly a risk in tough years if the ewes don't recover as well.
- (b) The good (surprising) points;
  - gave us more lambs and they were good lambs,
  - increased genetic gain.
- (c) The disappointing aspects;
  - getting them back after weaning to rejoin, especially in a tough spring.
- (d) Fit within your system and refinements required;
  - Yes- need to work on recovery to rejoin, but
  - No- in tough years.
- (e) Plans for the future, including 2013;
  - Draft off the ewe lambs greater than 43kg and join.
- (f) Questions that require further investigation;
  - role of genetic fat- having the right type of sheep,
  - recovery from August/September lambing to May/June lambing as a 2 year old.

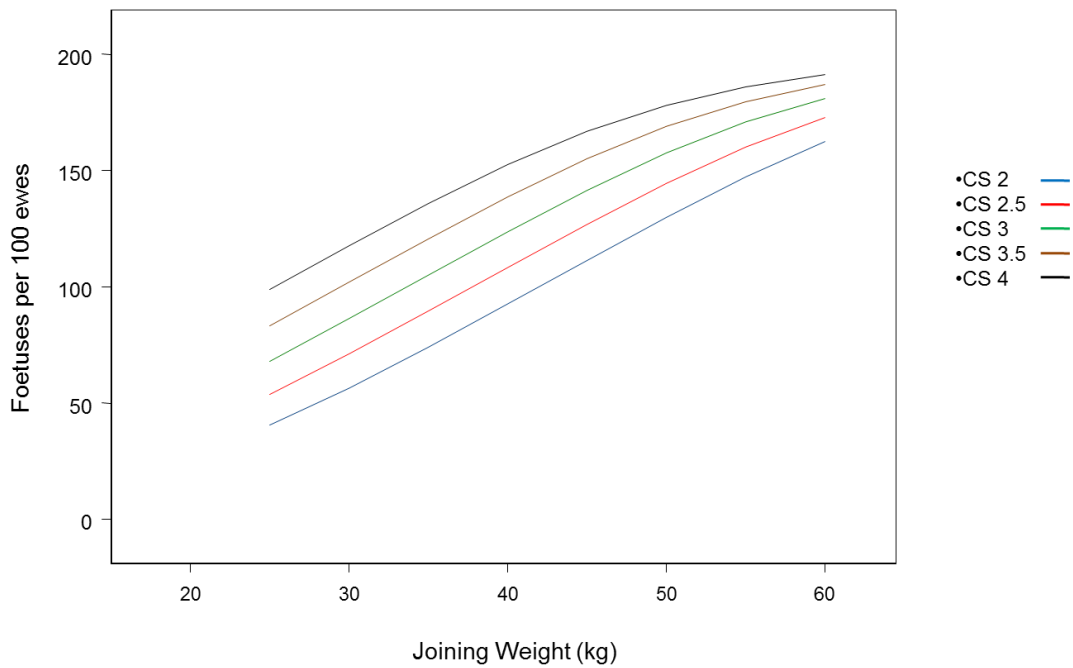
### 1.5.7 De Fegley flock

The De Fegley family run a dual purpose merino flock and broad acre cropping enterprises at Ararat in western Victoria. The PDS trial was De Fegley’s first attempt at joining ewe lambs and their results are summarised in Table 17.

**Table 17. Summary of De Fegley flock results for 2010**

Year	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
2010	8	330	192	98	40	42	54	80	24	35 (27-44)	2.8 (2.3-3.3)

The outcome achieved in 2010 represented a 3% (80 lambs from ewe lambs / 3000 lambs from adult ewes) increase in lamb production as a result of mating ewe lambs. The impact of joining weight and condition on ewe lamb conception rates for the De Fegley flock is depicted in Figure 11.



**Figure 11. Impact of joining weight and condition on conception rate of De Fegley merino ewe lambs**

**Feedback on mating and lambing ewe lambs:**

- (a) Their experience with mating and lambing down ewe lambs;
  - need very good nutrition the whole way through.
- (b) The good (surprising) points;
  - good mothers.
- (c) The disappointing aspects;
  - late pregnancy abortion due to *Campylobacter*.
- (d) Fit within your system and refinements required;
  - Yes- now lambing adults 1 month earlier we will get more ewe lambs to mate.
- (e) Plans for the future, including 2013;
  - use low birth weight dorset rams over the merino ewe lamb,
  - early wean and sell the lamb- keep the system very simple.
- (f) Questions that require further investigation;
  - making it work south of the divide.

Each of the flocks summarised above had sufficient data to undertake statistical analysis, and for each individual flock ewe lamb weight and condition score at joining were found to significantly ( $p < 0.01$ ) affect the conception rate, in both crossbred and merino ewe lambs mated between 7 to 10 months of age.

There were five other flocks involved in the trial that had insufficient data to analyse due mainly to poor pregnancy results. These flocks still provided feedback on the process of mating and lambing ewe lambs, as follows.

### 1.5.8 Kubeil flock

The Kubeil family run a dual purpose merino flock in north east Victoria. The PDS trial was their first attempt at joining ewe lambs and their results are summarised in Table 18.

**Table 18. Summary of Kubeil flock results for 2012**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Kubeil	7	444	382	49	13	14	17	50	11	39 (27-54)	3.1 (2.0-3.7)

#### Feedback on mating and lambing ewe lambs:

- (a) Their experience with mating and lambing down ewe lambs;
- didn't get a very high conception rate due to,
  - ewes were very young (barely 7 months),
  - rams very active at the end of joining (not sexually mature at start of joining).
- (b) The good (surprising) points;
- ewes that lambed went well and as heavy as ewes that didn't lamb as 2 year olds, and
  - the progeny from the ewe lambs grow out well.
- (c) The disappointing aspects;
- low conception rates,
  - abortion pre-lambing- never seen before in other age groups, and
  - a few ewes lambs prolapsed at lambing.
- (d) Fit within your system and refinements required;
- will depend on season and grain prices,
  - would work better with more lucerne in the system
  - Yes- if protein source (eg. Lupins) is cheap enough, and
  - if ewe lambs can recover from September lambing to July/August as adults.
- (e) Plans for the future, including 2013;
- not mating this year because of high conception in adults- need all my grain inputs, and
  - in future opportunistic based on sheep and grain prices.
- (f) Questions that require further investigation;
- recovery- bring back from first to second lamb,
  - difference in conception results at 7 month old mating rather than 8 to 9 months, and
  - questioning the impact of Lucerne on conception results.

### 1.5.9 Gibbs flock

The Gibbs family run a dual purpose merino flock in north east Victoria. The PDS trial was their first attempt at joining ewe lambs and their results are summarised in Table 19.

**Table 19. Summary of Gibbs flock results for 2012**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Gibbs	8	484	445	39	0	8	8	25	5	34 (20-45)	2.8 (1.7-3.5)

#### Feedback on mating and lambing ewe lambs:

- (a) Their experience with mating and lambing down ewe lambs;
  - only got 10% in lamb- not worth the effort, have to seriously question it.
- (b) The good (surprising) points;
  - it is possible to get them back in lamb but need to put in more effort to get them up.
- (c) The disappointing aspects;
  - low conception rates.
- (d) Fit within your system and refinements required;
  - no- too difficult trying to hand feed during harvest, and
  - need more labour.
- (e) Plans for the future, including 2013;
  - not an option they are too little.
- (f) Questions that require further investigation;
  - there is untapped potential because the ewes spends a third of her life being dry.

### 1.5.10 Pitcher flock

The Pitcher family run a dual purpose merino flock in north east Victoria. The PDS trial was their first attempt at joining ewe lambs and their results are summarised in Table 20.

**Table 20. Summary of Pitcher flock results for 2011**

Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Pitcher	8.5	240	184	45	11	23	28	50	21	41 (32-56)	3.3 (2.8-4.0)

#### Feedback on mating and lambing ewe lambs:

- (a) Their experience with mating and lambing down ewe lambs;
  - maturity of the ones that get in lamb unbelievable- they mature really quickly, but
  - challenge to get them heavy enough by joining.
- (b) The good (surprising) points;
  - good mothers, and
  - no set-backs to sheep at all.
- (c) The disappointing aspects;
  - low conception rates.
- (d) Fit within your system and refinements required;
  - Yes- need better process from birth to weaning to joining- keep them growing the whole way,
  - going to join adults to lamb in August so that ewe lambs will be joined at 8 months.
- (e) Plans for the future, including 2013;
  - if weights greater than 40kg we will join them.
- (f) Questions that require further investigation;
  - making it work south of the divide.

### 1.5.11 Dookie College flock

The Pitcher family run a dual purpose merino flock in north east Victoria. The PDS trial was their first attempt at joining ewe lambs and their results are summarised in Table 21.

**Table 21. Summary of the Dookie College flock results for 2010**

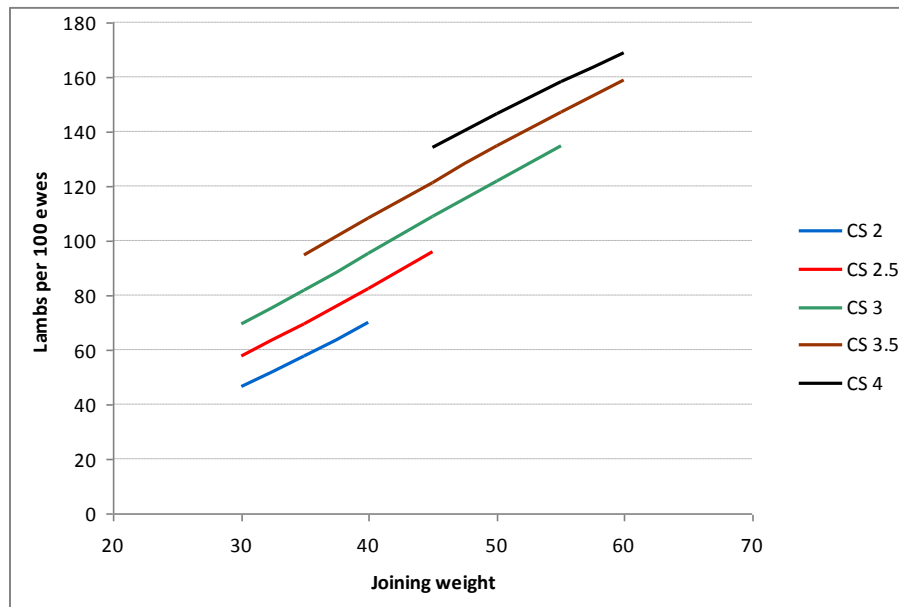
Participant	Age (mths)	No. joined 2010	Dry	Single	Twin	% Preg	Overall scanning %	Lambs Marked	Marking %	Weight at joining	Condition score at joining
Dookie College	7	450	434	12	0	3	3	7	2	33 (21-54)	2.8 (2.3-3.3)

Feedback on mating and lambing ewe lambs:

- (a) Their experience with mating and lambing down ewe lambs;
  - we struggled- only got 2% in lamb,
  - ewe lambs condition not high enough and spring born ewe lambs not mature enough.
- (b) The good (surprising) points;
  - none.
- (c) The disappointing aspects;
  - low conception rates, and
  - very labour intensive.
- (d) Fit within your system and refinements required;
  - No- too labour intensive,
  - we wean merinos young and let them coast- they grow wool and don't put on enough fat.
- (e) Plans for the future, including 2013;
  - none.
- (f) Questions that require further investigation;
  - none.

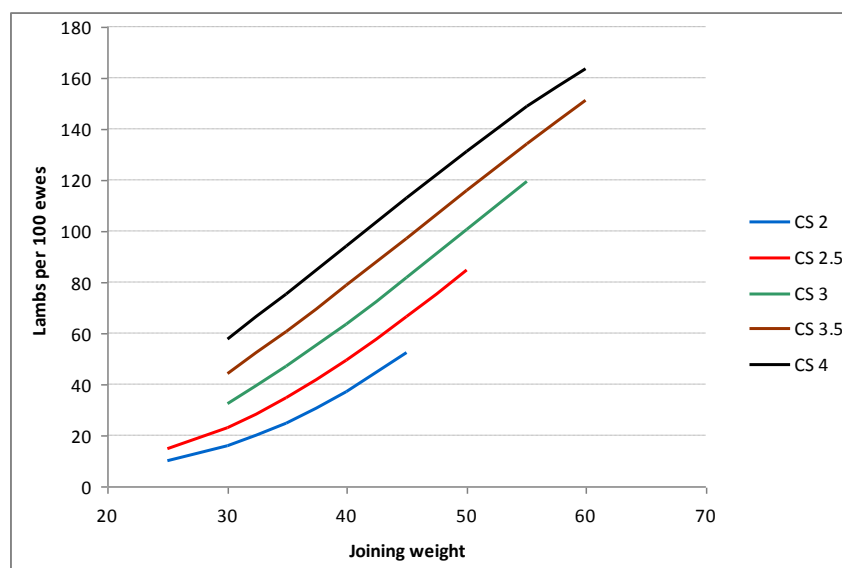
### 1.6 Overall summary of the impacts of live-weight and condition score at joining

On average the crossbred ewe lambs had higher conception rates than merino ewe lambs, but a feature of the data is the huge variation in performance between flocks (Tables 1 to 6). Live-weight at the start of joining explained a significant proportion of the variation in conception rates between flocks, between years within flocks and between individual ewes within a flock in a single year. The combined analysis of PDS flocks indicated that on average a 1 kg increase in live-weight at joining was associated with a 3.7 and 2.6% increase in reproductive rate (foetuses per 100 ewes joined) for merino and crossbred ewe lambs respectively (Figures 12 and 13).



**Figure 12. Impact of joining weight and condition on reproductive rate of merino ewe lambs**

There were also significant additional effects of condition score of ewe lambs at joining on reproductive rate (Figures 12 and 13), over and above correlated changes in live-weight, suggesting that early maturing ewes achieve higher reproductive performance when mated as ewe lambs. At a given live-weight an extra condition score at joining increased reproductive rate by 31 and 26% for merino and crossbred ewe lambs respectively.

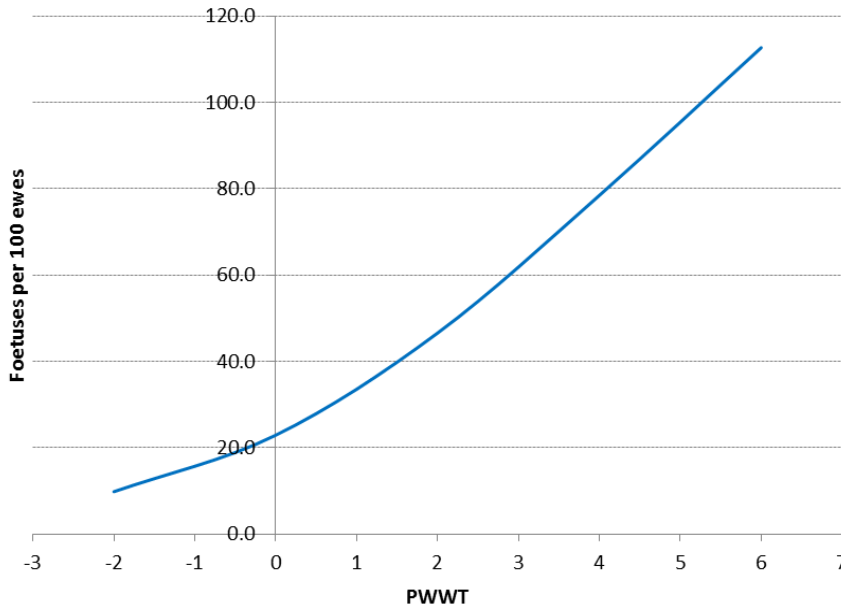


**Figure 13. Impact of joining weight and condition on reproductive rates of crossbred ewe lambs**



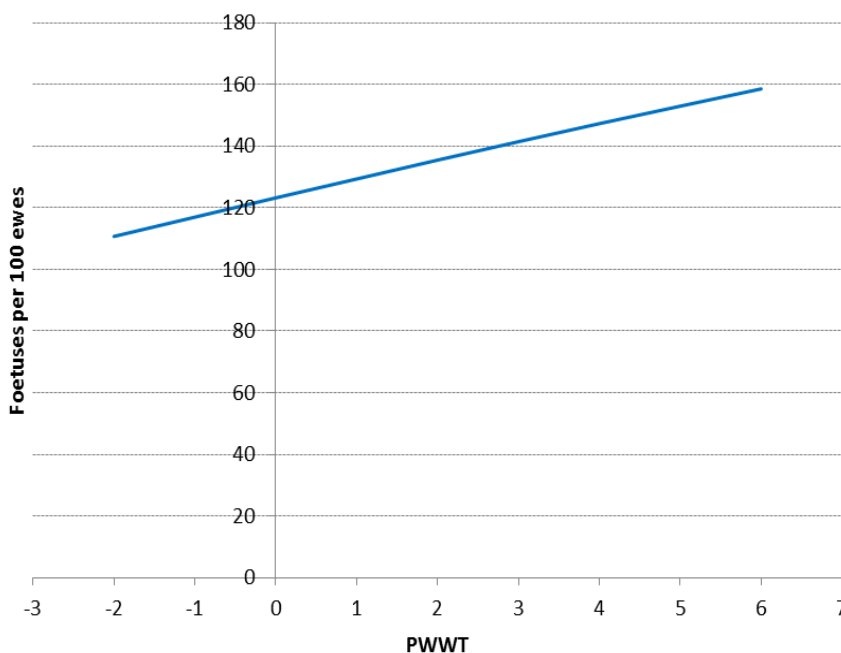
### 1.7 Impact of ASBV for post-weaning weight (PWWT) on reproductive rate

For the one merino flock involved in the PDS that had breeding values on the ewe lambs, there was a strong correlation between their ASBV for growth and their reproductive rate (Figure 14). For ASBV>1 for PWWT, reproductive rate for merino ewe lambs increased linearly by about 17% per one unit increase in PWWT.



**Figure 14. Impact of PWWT on reproductive rate of merino ewe lambs**

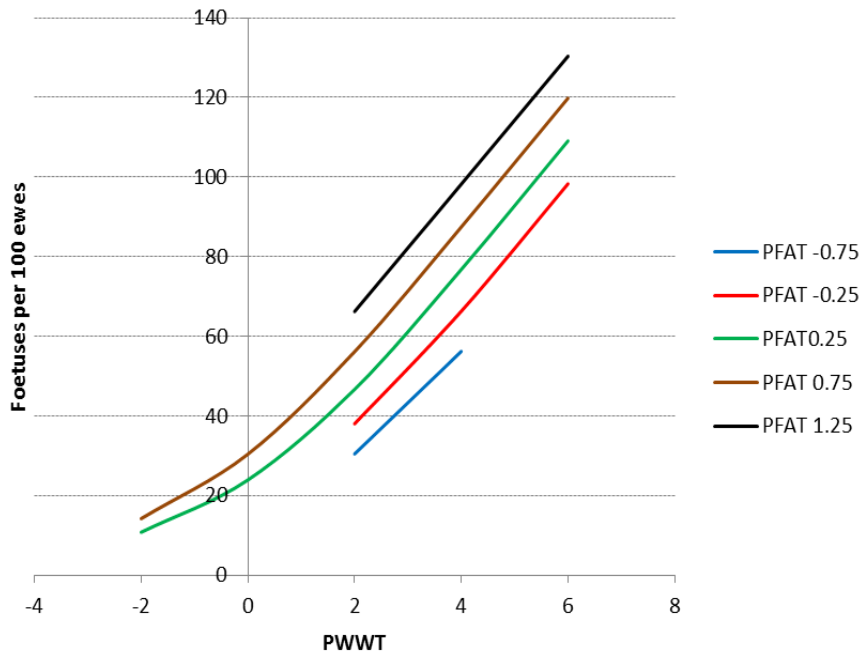
For the one crossbred flock involved in the PDS that had breeding values on the ewe lambs, there was a correlation between their ASBV for growth and their reproductive rate (Figure 15). For ASBV>1 for PWWT, reproductive rate for crossbred ewe lambs increased linearly by about 6% per one unit increase in PWWT.



**Figure 15. Impact of PWWT on reproductive rate of crossbred ewe lambs**

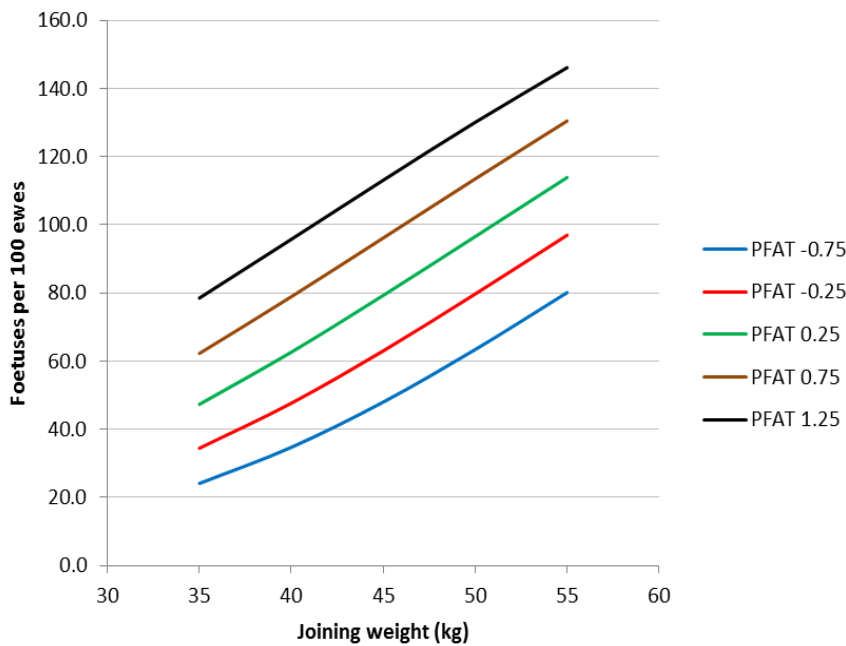
### 1.8 Impact of carcass traits in merinos on the reproductive rate of ewe lambs

ASBVs for fat at post-weaning age were also positively related to the reproductive rate of ewe lambs, and the fat effects remained significant when either PWWT (Figure 16) or actual joining weight (Figure 17) were included in the statistical model.



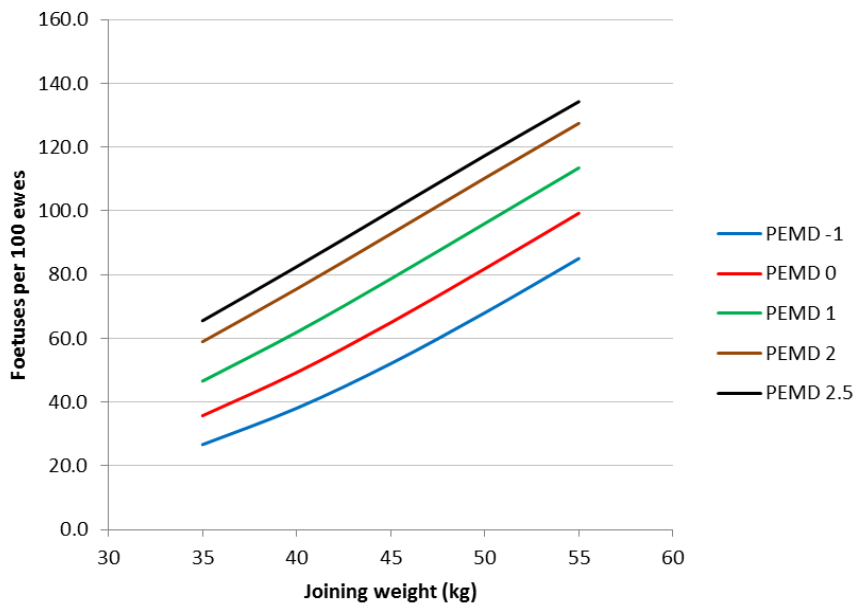
**Figure 16.** The effect of breeding value for post-weaning (PWWT) on reproductive rate of merino ewe lambs with different ASBVs for fat measured at post-weaning age (PFAT)

Interestingly at a given joining live-weight, an increase in one unit of fat measure at post-weaning (PFAT) resulted in a 50% increase in reproductive rate of merino ewe lambs (Figure 17), suggesting that earlier maturing ewes achieve a higher reproductive rate when mated as ewe lambs.



**Figure 17. The effect of live-weight at joining on reproductive rate of merino ewe lambs with different ASBVs for fat measured at post-weaning age (PFAT)**

ASBVs for muscle at post-weaning age were also positively related to the reproductive rate of merino ewe lambs, and the muscle effects remained significant when actual joining weight (Figure 18) was included in the statistical model.



**Figure 18. The effect of live-weight at joining on reproductive rate of merino ewe lambs with different ASBVs for muscle measured at post-weaning age (PEMD)**

Interestingly at a given joining live-weight, an increase in one unit of muscle measure at post-weaning (PEMD) resulted in a 27% increase in reproductive rate of merino ewe lambs (Figure 18).

### 1.9 Overall summary of the feedback by producers participating in the PDS on mating ewe lambs

The surprising or good points mentioned from mating and lambing ewe lambs by participants in the PDS are summarised in Table 22. Most participants specifically mentioned how well the ewes that lambed at 12-15 months performed as two-year olds. One PDS participant recorded 179% scanned in lamb rate for ewes that lambed at 13 months, which was 12% higher than the equivalent ewes that didn't lamb as lambs. Many participants also made specific comment about the mothering ability of the ewe lamb, their lambing ease and the quality of the lamb produced.

**Table 22. Summary of the good points mentioned from mating and lambing ewe lambs**

Surprising/good points from mating and lambing ewe lambs	Percentage of merino flocks (%)	Percentage of crossbred flocks (%)
Performed very well on second lambing	55	75
Maturity of the ewe lamb once pregnant and lambing	27	0
Great mothering ability	27	50
Increased genetic gain/turnover	27	25
Quality of the lamb produced off the ewe lambs	18	50
Lambing ease	18	50

The bad points mentioned from mating and lambing ewe lambs by participants in the PDS are summarised in Table 23. Most participants specifically mentioned the low conception rates achieved in ewe lambs as a disappointment with mating ewe lambs, along with questions about why ewes in good weight/condition still didn't conceive. Some lambing difficulties were also mentioned, particularly in single bearing crossbred ewe lambs. It should be noted that only one PDS participant recognised a reduction in conception rates of ewes that lambed as lambs, on their second mating.

**Table 23. Summary of the bad points mentioned from mating and lambing ewe lambs**

Bad points from mating and lambing ewe lambs	Percentage of merino flocks (%)	Percentage of crossbred flocks (%)
Low conception rates	36	50
Dystocia in singles	0	50
Prolapse issues	18	25
Abortion due to Campylobacter	18	0
Increased dries in second mating	9	0
Good ewes that didn't get in lamb	9	25

PDS participants were also asked about their intentions for mating ewe lambs in 2013 and all but one crossbred flock will continue to join ewe lambs in 2013. For the merino flocks, 27% will not join ewe lambs in 2013, and the remainder will join ewe lambs either opportunistically (36%) or routinely in the future (36%).

When questioned about whether joining ewe lambs fits their system, all crossbred believed that mating ewe lambs does fit their system. For the merino flocks, 64% believe it fits their system, while 36% felt it didn't fit their system due to either the high labour requirements of mating ewe lambs or not having a protein source/finishing system.

The PDS participants when then asked to highlight any modifications that would be required to help mating ewe lambs fit their system even more so. Their feedback is summarised in Table 24. Clearly a number of PDS participants are intending to lamb their adult ewes earlier so that their ewes lambs will be a month or so older for their first mating. Also the majority of the PDS participants need the ewe lambs to recover quickly from their first lambing so that their next lambing can be brought forward by up to 3 months.

**Table 24. Summary of the modifications required to increase the fit of mating ewe lambs with their system**

<b>Modifications needed to ensure it meets the system</b>	<b>Percentage of merino flocks (%)</b>	<b>Percentage of crossbred flocks (%)</b>
Lamb adults earlier to have older ewe lambs to mate	18	50
Need to get more ewe lambs lambing earlier	0	50
Recovery so that ewes come forward second mating	27	50
Balance ewe recovery versus early weaning	9	25
Class ewe lambs prior to first mating	9	0

The key questions regarding the mating and lambing of ewe lambs nominated by participants in the PDS are summarised in Table 25. The majority of PDS participants require the ewe lamb to recover from a spring lambing in late August/September to a winter lambing in June/July. To date PDS participants have achieved good conception rates on their second mating but are now realising to achieve higher conception results as a ewe lamb they need to join later, which has resulted in the need for the ewes to then be brought forward on their second mating to match in with the adult flock. The research question is if ewes lambs are well managed on their first lambing, to what degree can the majority (>80%) of the ewes be brought forward significantly (at least 2 months) on their second lambing. A related question that PDS participants had was what difference does every month of age at mating, after 6 months, at the same weight and condition, have on the conception rates of ewe lambs.

The other key question that PDS participants wanted addressed was why some ewes got in lamb and other didn't, particularly those down to 30 kg at joining. The opportunity exists, to revisit the flocks involved in this PDS and measure the mature weight of ewes that were mated as lambs and re-analyse the data based on joining weight as a percentage of mature weight. This may help explain the mating outcome achieved and allow a further refinement of extension messages to producers.

**Table 25. Summary of the key questions to investigate on mating and lambing ewe lambs**

<b>Key questions to investigate</b>	<b>Percentage of merino flocks (%)</b>	<b>Percentage of crossbred flocks (%)</b>
Recovery from first lambing in spring to lamb in June-July as a two year old	36	75
Responsiveness of different genetics	27	0
Difference in conception at 7 months compare to 9	27	25
Determine why some ewes got in lamb and others didn't- percentage of adult size	27	75
Can it be done south of the divide in Victoria	27	0
Impacts on ewe longevity	18	50
Pregnancy, lambing and lactation management	18	50

### 1.10 Break even marking rates for merino ewe lambs

The data generated in the PDS was provided to John Young, Farming Systems Analysis, to undertake a break even analysis using MIDAS. A key objective of this PDS was to determine the break even marking percentage required for ewe lambs to offset the costs associated with getting the ewe lambs to a joinable weight, at varying lamb prices. The value of an extra lamb outlined in Table 26 (fully- stocked farm) and 27 (under-stocked farm) at varying lamb prices, is the gross margin value of an extra lamb taking out the extra costs of pregnancy and lactation. While the extra feeding costs, is the cost of feed invested in the ewe lamb over and above a ration that would deliver the widely recommended growth of 1 kg/month in merino weaners.

Table 26. Breakeven marking rate for mating ewe lambs - fully stocked farm

Lamb Price / Value	Value of extra Lamb	Extra Feeding Cost (above ration to achieve 1 kg/month growth rate) (\$/hd)						
		10	15	20	25	30	35	40
\$/kg								
\$2/kg	15	66%	99%	132%	166%	199%	232%	265%
\$3/kg	27	38%	56%	75%	94%	113%	132%	150%
\$4/kg	39	26%	39%	52%	64%	77%	90%	103%
\$5/kg	54	19%	28%	37%	46%	56%	65%	74%

Table 27. Breakeven marking rate for mating ewes lambs - understocked farm

Lamb Price / Value	Value of extra Lamb	Extra Feeding Cost (above ration to achieve 1 kg/month growth rate) (\$/hd)						
		10	15	20	25	30	35	40
\$/kg								
\$2/kg	27	37%	56%	74%	93%	112%	130%	149%
\$3/kg	47	21%	32%	42%	53%	63%	74%	84%
\$4/kg	69	14%	22%	29%	36%	43%	51%	58%
\$5/kg	96	10%	16%	21%	26%	31%	36%	42%

The merino flocks that participated in the PDS for more than one year achieved an average marking rate of 50% (3517 lambs from 6980 ewe lambs) to ewes joined. In Table 26 and 27 the breakeven marking rates at varying lamb prices and feed input costs that are shaded green are considered achievable (ie. less than 50% marking rate) based on the results of this project. Whereas the marking rates shaded red are not likely to be achieved from ewe lambs. The areas shaded yellow and orange are for breakeven marking rates from 56 to 77%, which would require absolute best practice in ewe lamb mating and lambing to achieve based on the results of this PDS.

## Communications

The ewe lamb joining PDS has generated significant interest from producers within and outside of the participating group. Having producers involved from six different BESTWOOL/BESTLAMB (BWBL) groups has provided an excellent forum for discussion around joining ewe lambs at 7-10 months of age.

A total of 4 field days have been held at Ararat, Elmore, St Arnaud and Serpentine with 87 producers attending. Each session discussed the preliminary findings of the PDS and the pros and cons of joining ewe lambs. There was interest from both crossbred and merino breeders in joining ewe lambs. A lot of discussion from crossbred producers in particular focussed around feeding an animal for 18 months with little return if not joined as lambs.

The BWBL annual conference promoted the findings from the PDS in 2011 during a concurrent session. The attendance rate was high with more than 60 at each of the 3 sessions. This attendance rate again reinforced the high level of interest in this area.

Two articles have been published in Feedback Magazine, "Young mums make more lambs" (Appendix 1) in July 2012 and "The weighing game" (Appendix 2) in January 2013. The first article provided a summary of the PDS with some of the initial findings, along with an interview with Ben Duxon discussing his experiences from the PDS. "The weighing game" is an interview with Jock McGregor which provides an overview of his results and thoughts on joining ewe lambs.

A number of other case studies have been written on PDS participants and their experiences from joining ewe lambs. Feature articles have been published in both the Stock and Land and the weekly Times, along with an article in the BWBL newsletter.



## Conclusions

Mating merino and crossbred ewes at 7 to 10 months has proven to be an effective way of lifting lamb production by more than 10% in the flocks participating for multiple years in this project. These flocks achieved a 60% conception rate in merino ewe lambs and a 75% conception rate in crossbred ewe lambs mated at 7 to 10 months of age. It was found that both the weight and condition score of ewe lambs at joining significantly affected the reproductive rate in both merino and crossbred ewe lambs. In fact the combined analysis of PDS flocks indicated that on average a 1 kg increase in live-weight at joining was associated with a 3.7 and 2.6% increase in reproductive rate (foetuses per 100 ewes joined) for merino and crossbred ewe lambs respectively. There were also significant additional effects of condition score of ewe lambs at joining on reproductive rate, over and above correlated changes in live-weight, suggesting that early maturing ewes achieve higher reproductive performance when mated as ewe lambs. At a given live-weight an extra condition score at joining increased reproductive rate by 31 and 26% for merino and crossbred ewe lambs respectively.

Genetic parameters were also found to significantly affect reproductive rate of both merino and crossbred ewe lambs, albeit one merino and one crossbred flock had ASBVs on the ewe lambs involved in this project. It was found that per one unit increase in post-weaning weight (PWWT) reproductive rate increased by 17% in merinos and 6% in crossbreds. In addition carcass traits in merino ewe lambs were shown to be positively correlated with reproductive rate, where at a given joining live-weight an increase of one unit in post-weaning fat (PFAT) and post-weaning muscle (PEMD) resulted in a 50% and 27% increase in reproductive rate, respectively.

A number of significant barriers and concerns participating producers had to mating and lambing ewe lambs were overcome in this project. Firstly, it was demonstrated that reasonable reproductive rates could be achieved, second that the majority of pregnant ewe lambs were able to lamb down and rear their lambs successfully, and finally that with targeted management these ewes achieved high reproductive rates on their second mating. In addition a ready reckoner was developed that producers could use to determine the break-even marking rate they would need to achieve with varying grain prices and lamb prices. This enabled producers to make a more informed decision year to year on whether to mate their ewe lambs. However, this project did identify a number of other questions such as;

- the impact of weight change during joining on reproductive rates- ie. what is the increase in reproductive rate for every 100g/day extra growth rate during joining,
- impact of age at joining on reproductive rates- ie. what is the increase in reproductive rate for every extra month of age at the start of joining,
- earlier maturing ewe lambs appear to have achieved higher reproductive rate- ie. what is the relationship between percentage of adult weight at mating and reproductive rate,
- pregnancy management that optimises the survival of both twin and singles born lambs from ewe lambs, and
- the older a ewe lamb is mated the better the result however it has to fit the system- ie. how can the recovery rate from first lambing in the spring to second lambing in winter be optimised.

The merino flocks that participated in the PDS for more than one year achieved an average marking rate of 50% (3517 lambs from 6980 ewe lambs) to ewes joined. The flocks involved embarked on joining ewe lambs to lift the number of breeding ewes on their farm. In the breakeven marking rate analysis undertaken at varying lamb prices and feed input costs this marking result was better than breakeven at \$5/kg CWT for lamb even up to \$40 per head extra

feeding cost, better than breakeven at \$4/kg CWT for lamb even up to \$30 per head extra feeding cost and better than breakeven at \$3/kg CWT for lamb even up to \$20 per head extra feeding cost. Hence for the period from 2010 to 2012 mating ewe lambs at 7 to 10 months proved to be economically viable given that during that period lamb prices seldom fell below \$4/kg CWT for lamb and extra feeding costs rarely exceeded \$30 per head.

## **Acknowledgements**

Sincere thanks to all the trial hosts for having a go at mating ewe lambs. Although the results varied all producers involved had the attitude let's trial mating ewe lambs and see what we can learn.

Thank you also to Meat and Livestock Australia for funding the project through the PDS program.

Lastly, this project would not have eventuated without the drive and enthusiasm of members of the BESTWOOL / BESTLAMB network.

## Appendix 1 “Young Mums Make More Lambs”

20  
On-farm



*A research project in Victoria is helping shed light on the production challenges of successfully joining Merino ewe-lambs at just seven to nine months of age.*

**O**ver 18,000 ewe-lambs have been monitored to discover if there is a correlation between joining weights and condition scores with conception rates over the past three years.

This work is the backbone of an MLA producer demonstration site in collaboration with the Victorian Best Wool Best Lamb network.

The goal is to develop guidelines and a best practice manual for Merino breeders wanting to increase production of their breeding flocks or fast-track genetic improvement by joining ewe-lambs at an early age. Although the focus of the project is on Merinos, crossbred ewe-lambs have been included.

Lyndon Kubell, Making More From Sheep (MMFS) State Coordinator with Victoria Department of Primary Industries (DPI), said the research revealed it was possible to

successfully join Merino ewe-lambs, but it had been a steep learning curve for the producers involved.

*“The research is promising in that it shows it is certainly possible to achieve reasonable conception rates in Merino ewe-lambs,” Lyndon said.*

“It hasn’t been all roses, however, and there have been some big variations in pregnancy rates of 4% to 70%.

“But nearly every flock in the PDS has achieved a big improvement in conception performance from year one to year three, and that has all been part of the learning of this project - finding out where we need to be in the management of ewe-lambs to get a successful joining result.”

### Trial scale

All the ewe-lambs in the trial have been individually identified with electronic ear tags, and weight and condition score data has been collected at joining. The 15 flocks involved in the trial from across Victoria all join in the autumn for a spring lambing.

The ewe-lambs are then pregnancy scanned at 80 days, with follow-up

monitoring to assess the impact, if any, of early joining on future fertility and production.

“We have good data to show that, provided the management of the ewe-lambs is good and they receive adequate nutrition, there is no problem in getting the ewe-lambs back in lamb the second year,” Lyndon said.

The next phase of the project will involve economic modelling and a cost benefit analysis.

“We should have some definitive answers and guidelines in the next 12-months to help producers decide if the joining of Merino ewe-lambs is a practical and viable option for their enterprise,” Lyndon said.

**4% to 70%**

variation in pregnancy rate in PDS ewe-lambs

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Order // Tips & Tools: 45x7 - Joining ewe-lambs for more profit from  
[www.mla.com.au/joining-ewe-lambs](http://www.mla.com.au/joining-ewe-lambs)

**Snapshot**Ben and Cheryl  
Duxson, Marnoo, Vic.**Property:**  
2,200ha**Enterprise:**  
Glendemar Merino  
stud, selling  
400 rams on-farm  
each spring**Livestock:**  
2,600 stud  
Merino ewes**Pasture:**  
Dryland lucerne and  
native perennials**Soil:**  
Grey loam**Rainfall:**  
425mm**54%**conception rate for  
ewe-lambs joined at 41kgs**82%**conception rate for  
ewe-lambs joined at 45-50kgs

*Ben Duxson advocates assessing the physical traits in a flock before embarking on ewe-lamb joining.*

physically looked more like a meat sheep, with mature ewes weighing 60-70kg liveweight and cutting 4.5-5.5kg of 19-19.5 micron wool when shorn every eight months.

"The most critical factor to getting ewe-lambs in lamb is weight - the higher the weights the better conception," Ben said.

**On-farm results**

Last year the Duxson's joined 935 ewe-lambs with a 54% conception rate. At joining they weighed 41.1kg liveweight and were in condition score 3.4.

In comparison, a smaller 'control group' which weighed 45-50kg at joining achieved conception rates of 82%.

Ben said an analysis of the ewe-lambs Australian Sheep Breeding Values (ASBVs) supported his view that animals with better body weight, muscle and fat, conceived better.

He said of the ewe-lambs joined and monitored last year, the animals that became pregnant had average ASBVs of: 75 for yearling weight; 1.6 for yearling eye-muscle depth; and 0.6 for yearling fat depth, compared to industry averages of 2.5, 0.3 and 0.0 respectively.

The ewe-lambs that didn't conceive had lower ASBVs of: 5.3 for yearling weight; 1.1 for eye muscle depth; and 0.2 for yearling fat.

The take home message for producers considering joining ewe-lambs, Ben said, was to evaluate if their sheep had the physical traits and potential to conceive at an early age.

**Careful management**

Ben said, to be in optimum joining condition, careful management and planning was needed to ensure that the ewe-lambs, born in August and September, didn't receive any set backs.

For Glendemar this involves yard weaning the lambs at 12-weeks of age or about 20kg plus.

"We have been trialling yard weaning as a way of settling the ewe-lambs down more quickly into their social groups and building the hierarchy, as this stops them walking fences for days and losing weight," he said.

The ewe-lambs are then run on lucerne, with access to lupins and barley in self-feeders, to maximise growth in the lead-up to joining in April. →

## Weighing up early joining options

Attention to detail is proving essential for success with joining ewe-lambs for one western Victoria breeder.

**P**ractical experience has shown stud breeder Ben Duxson the importance of "ticking all the boxes" when it comes to successfully joining Merino ewe-lambs at just seven to nine months of age.

The Duxson family, who operate the Glendemar Merino stud at Marnoo in Victoria, have been involved in the MLA - Best Wool Best Lamb (BWBL) ewe-lamb joining producer demonstration site project since its inception three years ago, last season achieving its best result of a 54% pregnancy rate.

While Glendemar has always been keen to fast-track genetic gain by joining the newest generation of lambs as early as possible, Ben has found it isn't a simple process.

"Ten or 15 years ago we were trying to join ewe-lambs but only getting conception rates of 10-15%, whereas last year we achieved more than 50%. Our goal is to get to 80-90%," Ben said.

"Joining ewe-lambs is a specialist area and you really need to follow a lot of steps and tick off a lot of boxes as you go along to achieve a good result."

A member of the Multi Purpose Merino (MPM) group, Ben said their sheep were bred to be early maturing with plain body types and high fertility. He said they

**Top tips**

- Target optimum ewe weight and condition score
- Higher muscle and fat in ewe-lambs also important
- Yard wean ewe-lambs at 12 weeks or 20kgs
- Maximise growth with good nutrition prior to joining
- Manage joining carefully
- Give preferential treatment to pregnant ewe-lambs
- Wean lambs off ewe-lambs early

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**On-farm**

→

Dryland lucerne provides the most cost-effective form of feed over the summer months for Glendeman's early joining program.

"If we happen to get a couple of summer storms, the cost of feeding is greatly reduced as the lucerne provides all the energy and protein the ewe-lambs need," he said.

**Other considerations**

Ben said the ewe-lambs were also primed with sterile rams for at least a month before being joined at 5% with ram lambs. The ewe-lambs are only joined for two cycles or four weeks, and a fresh batch of ram lambs are put in after a fortnight.

Scanning is at 80 days, with the pregnant ewes receiving preferential treatment for feed.

"You are basically asking a lamb to grow a fetus while she is still growing herself so you have to plan ahead to ensure their nutritional requirements are met," he said.

Lambs off the ewe-lambs are weaned early at eight-weeks to give the sheep extra time to recover for the following joining.

Ben said there was a cost involved with joining ewe-lambs and he is now offering his data for economic modelling research.

A sister stud in WA is also involved in ewe-lamb joining research with Murdoch University and this will also provide more data and financial outcomes in the next 12 months.



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## Feeding for better fertility

Strong lamb prices and low supply mean that many producers are keen to build flock numbers, but what's the best way to do it?

Sheep CRC postgraduate student Cesar Rosales Nieto is looking at whether joining Merino ewes earlier, at 8-10 months rather than the traditional 18 months, may provide the solution.

Cesar's research is aimed at developing guidelines to achieve consistent and cost-effective reproductive performance from Merino ewes joined at 8-10 months.

"My research is important because it addresses an aspect of the production system that has the potential to improve efficiency for sheep producers," he said.

**"The sheep industry needs to improve the reproductive efficiency of the ewe flock to meet current and future demands for replacement ewes for flock rebuilding, slaughter lambs, mutton and live export."**

His research project started in 2009 and is funded by the WA's Department of Agriculture and Food (DAFWA), MLA and the Sheep CRC, and also involves Murdoch University and the University of WA.

Cesar began his research journey in Mexico, his country of birth. With a bachelor degree (honours first class) from the University of San Luis Potosi (Faculty of Plant and Animal Science), he studied the relationship between reproduction and nutrition in Creole goats for his honours project.

*Cesar Rosales Nieto's research on joining Merino ewe-lambs is shedding light on how high fertility can be achieved.*

He worked at Mexico's National Institute of Forestry, Agricultural and Livestock Research (INIFAP) as a researcher until 2004 when he went to Texas A&M-Kingsville to undertake a master's degree in Animal Science. He was accepted for his PhD in 2009.

"Basically my research interests are in reproduction and nutrition of small ruminants. Since I started working here in Australia my interests have expanded to different areas such as genetics and this combination fits perfectly with the Australian industry," Cesar said.

"Previous research has shown that it is possible to mate Merino ewe-lambs at 8-10 months of age but the results are highly variable. It is therefore important to develop management guidelines to improve the likelihood of success.

"Our research shows that under the right management conditions fertility rates above 75% can be achieved."

To reach these high fertility rates Merino ewe-lambs need to be more than 45 kilograms at the start of joining as well as gaining more than 100 grams per day during the joining period.

This requires good nutritional management as well as the right genetics for good growth rate.

Lambing a year earlier, through joining at 8-10 months of age, can increase the lifetime reproductive performance of a ewe by around 20%."



**Cesar Rosales Nieto**  
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## Appendix 2 “The weighing Game”

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On-farm



Reproductive efficiency

The weighing game

A Victorian prime lamb producer is seeing a correlation between ewe weight at joining and conception rates by using an innovative approach to increasing production.

**Snapshot**  
 Jock and Maree  
 McGregor,  
 Callawadda, Vic.



**Property:**  
2,400ha

**Enterprise:**  
Dual purpose  
meat and wool  
Merino flock and  
broadacre  
cropping

**Livestock:**  
2,000 Merino ewes

**Pasture:**  
Medic clover and  
ryegrass and  
dryland lucerne

**Soil:**  
Varies from  
friable black to  
gravelly soils

**Rainfall:**  
425mm

**P**articipating in a MLA-funded producer demonstration site (PDS) program into joining ewe lambs has shown Victorian producer Jock McGregor the potential benefits of having Merino ewes in full production a year earlier than usual.

His three years of data, however, has also given him an insight into how challenging it can be to achieve good conception in Merino ewe-lambs, especially in tough seasons.

“You can certainly pick up income, with the main benefit coming in the second year when we have been able to mark over 120% of lambs out of ewes that, if they hadn’t been joined as lambs themselves, would still have been coming into production as maidens,” Jock said.

“But from my experience joining ewe lambs wouldn’t be

for everyone as it requires a reasonable amount of time and work.”

### Gathering data

The McGregors are one of 15 Victorian enterprises participating in the three-year PDS which has collected information on nearly 20,000 ewe lambs to create best practice guidelines for the industry.

“A lot seems to hinge on body weight, and if you are not close to the mark on body weight you are not going to do any good with conception - our figures from 2011 tell you that,” he said.

The McGregors begin lambing each year on 1 September, meaning spring and summer feed conditions play a big role before joining the ewe-lambs in April at eight months of age.

In 2010, when summer rains kept feed green, 256 ewe lambs were joined and at pregnancy

scanning had a 90% conception rate. The ewe lambs had weighed an average of 40kg and were condition score 3 plus.

In 2011, when the season was much drier, the ewe-lambs lacked maturity and averaged less than 38kg at joining and conception rates fell to 56%.

This year the McGregors opted to put their ewe-lambs into a feedlot, generally used each year to finish their Merino wether lamb portion.

Jock said the 739 ewe lambs were fed for 10-weeks over the joining period on an 80/20 mix of barley and lentils at a cost of about \$30 a head. At joining, the lambs averaged 39kg and condition score 3 to 3.2, and returned a conception rate of 78%.

Jock said he wouldn’t necessarily join ewe lambs every year, but rather would let seasons and economics dictate.

38kg joining weight

**58%**  
conception rate

39kg joining weight

**78%**  
conception rate

40kg joining weight

**90%**  
conception rate

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**o** Download // *Wean More Lambs* module of Making More from Sheep  
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