



Department of
Agriculture and Food



Western Australian Sheep Producer Survey 2014

**By Anne Jones and Mandy Curnow
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SHEEP CRC

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Executive summary

This report documents the results of the 2014 Western Australian producer survey that was part of a larger national survey conducted for the Sheep Cooperative Research Centre (CRC). It is essentially a repeat of a survey conducted in 2011 (Western Australian Farmer Survey 2011, Department of Agriculture and Food, Western Australia). Where it is useful, data from these other surveys has been included for comparison.

Key findings of the surveys include:

Dominant mating type and marking percentage

- The number of respondents with ewes mated to meat and maternal sires has reduced from 68% to 62%.
- The average number of Merino ewes mated has declined by 11%.
- The average number of meat and maternal ewes mated has declined by 14%.
- The marking percentage has improved for merino matings by 6% to 90%, and by 3% to 95% for meat and maternal matings.
- The gap between the marking percentage for meat and maternal matings and Merino matings is closing (was 8% higher, now only 5% higher).

Knowledge of Australian Sheep Breeding Values (ASBVs)

- The proportion of Western Australian producers that haven't heard of ASBVs has decreased from 20% to 13% (although only 7% of producers nationally haven't heard of ASBVs).
- Fewer Western Australian producers (4%) consider that they have more detailed knowledge of ASBVs than producers nationally (9%).

Breeding or selling rams

- The proportion of commercial producers that purchase rams to service their flock has declined from 76% in 2011 to 69% in 2014.
- The proportion of producers that do not breed or purchase rams or semen has increased from 2% to 6%.
- Thirty six per cent of ram breeders (with 50% of all rams sold) sell all of their rams with ASBVs.
- More than 50% of the larger ram sellers sell all of their rams with ASBVs.
- Forty nine per cent of all rams sold by Western Australian ram breeders are sold with ASBVs.

Stud and ram selection

- Nineteen per cent of producers (6% more than in 2011) use genetic information such as ASBVs or indexes to select a breeder that matches their breeding objective.
- Producers are less likely to select rams only from their regular ram source (50% in 2011 compared to 36% in 2014).
- Thirty eight per cent of producers that have always gone to the same stud source do so because they have assessed their stud's performance data at some stage and have not seen the need to reassess.
- Fewer producers select rams mainly on visual appeal (8% in 2014 compared to 16% in 2011).
- The proportion of ram buyers that select rams based on some level of performance data or genetic information has increased from 74% in 2011 to 85% in 2014.

Pregnancy scanning

- Pregnancy scanning is a practice carried out routinely by 40% of respondents, of which 14% scan for litter size.
- At 50%, 7% fewer Western Australian than national producers pregnancy scan.
- At 14%, 11% fewer Western Australian than national producers scan for litter size.
- The average marking percentage is 5% higher for Merino producers that scan and 4% higher for meat producers that scan (as opposed to those that don't).
- Sixty one per cent of producers that scan manage their dry, single and twin bearing ewes on individual need.

- The proportion of producers that don't change their nutritional management practice according to scanning results has reduced from 11% to 5%.
- The average scanning per cent for Merino mating is 120%.

Condition scoring

- Nine per cent of producers use objective measurement to assess the health of their ewes regularly.
- Visual assessment of ewes in the paddock is still the preferred method of monitoring ewes in Western Australia (WA) regardless of enterprise type.
- The proportion of producers that only assess ewe nutritional status visually has reduced from 69% to 58%, mainly from wool and prime lamb producers (-19%) and wool producers (-12%).
- The proportion of producers that occasionally use objective measurement to assess ewes has increased from 24% to 33%.

Lamb survival

- Seventy one per cent of Western Australian producers had undertaken some activity to improve lambing percentage in the five years prior to 2014.
- Ninety six per cent (of that 71%) of Western Australian producers opted to ensure ewes nutritional demands were being met before and during pregnancy.

Marking and mulesing practices

- Twelve per cent of producers with merino lambs don't undertake the mules operation.
- Fifty nine per cent of merino lambs being mulesed are being mulesed with pain relief.

Worm control practices

- Twenty four per cent of Western Australian producers conduct worm egg counts (WECs), whereas nationally 42% of producers conduct WECs.
- Of those Western Australian producers that do WECs, 94% conducted WECs on their weaners and 72% on their hoggets in 2013.
- Nationally, 17% more producers tested their weaners (62% compared to 45%) and their hoggets (46% compared to 29%) two or more times than in WA.
- Eighty seven per cent of Western Australian producers have a worm control program that includes rotating drenches (less than at a national level: 91%).
- Fifty per cent of Western Australian producers have a worm control program that includes grazing management (less than at a national level: 59%).
- Eighteen per cent more Western Australian producers (net) believe that drench resistance is more important than it was five years prior (compared to 30% of producers nationally).
- Seven per cent of Western Australian producers with 11% of the represented flock use fully (100%) effective drenches.

Lice control practices

- Sixty three per cent of Western Australian producers treat for lice every year and 32% treat only when lice are seen.
- Ninety three per cent of producers that treat their sheep for lice every year do so "just in case" there is contact with untreated sheep or they had been missed in other treatments.

Flystrike control practices

- Six per cent more producers treat sheep to prevent flystrike only when the risk is high (now 26%).
- Six per cent fewer producers only treat individually struck sheep (now 33%).
- Of the respondents, 88% are attempting to improve their genetics for flystrike resistance.

1. Background to the producer survey

This survey was conducted on behalf of Program 1 of the Cooperative Research Centre for Sheep Innovation (Sheep CRC) in February of 2014 for the purpose of gathering information on sheep management practices. This is primarily a repeat of a benchmarking survey conducted in 2011. A comparison of the information gathered in 2011 and 2014 revealed the impact that the Sheep CRC and its collaborating partners had on the national sheep industry. The Department of Agriculture and Food, Western Australia (DAFWA) commissioned extra responses to be collected from Western Australian sheep producers to provide adequate numbers for an analysis across zones and enterprises. In 2014, 368 Western Australian sheep producers were surveyed and in the 2011 survey, 377 took part. Throughout this report, comparisons are made between the 2011 and 2014 data and between Western Australian and national data to gain a deeper understanding of the results.

In order to take part in the survey, respondents needed to meet certain criteria including: having more than 500 sheep and operating within the medium rainfall zone (MRZ) or cereal-sheep zone (CSZ). The MRZ and CSZ are considered to be of greatest interest because the majority of sheep producers and sheep in WA are in these two zones. Producers were matched with the production zone using their postcode. The zones reflect the different growing conditions:

- The Western Australian medium rainfall zone (MRZ) has a six month growing season. It includes the whole south west, from the Perth area in the north, to Albany in the south.
- The Western Australian cereal sheep zone (CSZ) has a five month growing season. It extends from the Geraldton area in the north west to the Esperance region in the south east.

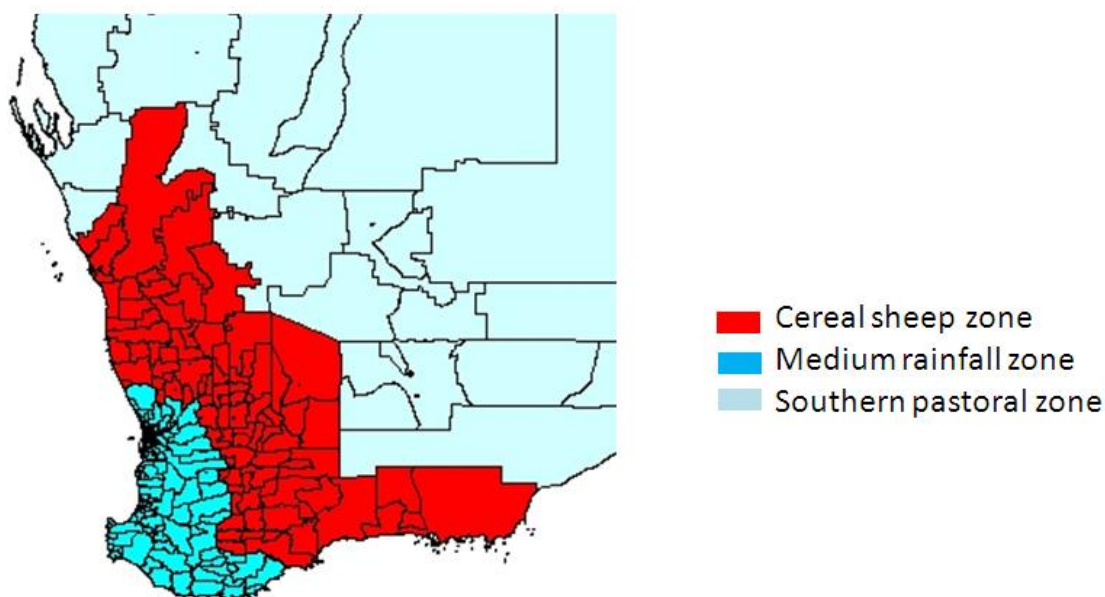


Figure 1 Production zones as defined and used by the Sheep CRC and DAFWA

The responses from the 2011 and 2014 surveys are often broken down further within this report (for example to classify producers by zone, enterprise type and various behavioural criteria) for the purposes of comparing groups and exploring a deeper understanding of the factors that influence producers. The symbol '*n*' appears on tables to show the total number of respondents that have been included within that analysis.

Please refer to Appendix 1 to 3 for a full list of survey questions and for more details on the sampling and interviewing methodology.

2. Representativeness of survey respondents

Key findings:

- Survey respondents from the MRZ make up 7% of Western Australian sheep producers in the MRZ.
- Survey respondents from the CSZ make up 9% of Western Australian sheep producers in the CSZ.

The survey results are based on responses from about 9% of sheep producers in the CSZ and 7% of sheep producers in the MRZ (Table 1). When the 2011 survey was conducted the intention was to sample an equal proportion of both regions. Subsequent analysis indicated that there were a higher proportion of respondents in the CSZ. To be able to compare the results of the 2014 survey with the 2011 survey the same breakdown was applied to the collection of data in the 2014 survey. This means that the total results presented have a slight bias towards the CSZ.

Table 1 Basic demographics of survey respondents representing Western Australian sheep producers by zone

Zone	Number of Western Australian producers	Percentage of Western Australian producers	Number of respondents	Percentage of respondents	Respondents percentage of producers in zone
Medium rainfall zone (MRZ)	2103	43%	136	36%	6.5%
Cereal sheep zone (CSZ)	2807	57%	242	64%	8.6%
Total	4910		378		7.7%

3. General demographics, enterprise and production results

3.1 Enterprise type

Key findings:

- Fifty six per cent of Western Australian producers are wool and prime lamb enterprises, 33% wool and 12% prime lamb.
- Seven per cent more producers in the MRZ identify themselves as prime lamb producers; 6% more producers in the CSZ identify themselves as wool producers.
- The average flock size is 4402 sheep; 5282 in MRZ and 3913 in CSZ.
- The average grazing hectares (ha) is 2303 ha; 2911 ha in the CSZ and 1222 ha in the MRZ.
- Eighty one per cent of the agricultural area's grazing can be found in the CSZ.
- Sixty one per cent of the agricultural area's grazing can be found on wool and prime lamb enterprises.
- Eight per cent of the agricultural area's grazing is dedicated to prime lamb production; 68% of that in the CSZ.

To establish potential points of difference based on production focus and intensity, the respondents were asked key questions regarding their production, including:

What is the primary purpose of your sheep enterprise (wool production, prime lamb production or wool and prime lamb production)?

The primary purpose of the sheep business nominated by the producers reflects the focus of each farmer. It does not necessarily match the on-farm joining to Merino or meat rams.

Farms with a mix of wool and prime lamb enterprise systems are the most common in Western Australia. There are significantly more producers (+7%) with a focus on prime lamb in the MRZ than the CSZ. In the CSZ there are 6% more producers than in the MRZ with a wool focus.

In the CSZ there are more wool producers in 2014 than there were in 2011 (28 to 35%) and less in the wool and prime lamb enterprise type (from 64% to 56%), although these differences are just not significant at $p < 0.10$. There was no observable movement between enterprises in the MRZ.

Table 2 Enterprise type by zone for the 2011 and 2014 WA producer surveys based on the number of respondents

Zone	Wool (2011)	Prime lamb (2011)	Wool & prime lamb (2011)	Wool (2014)	Prime lamb (2014)	Wool & prime lamb (2014)
MRZ	38 29%	20 15%	75 56%	39 29%	22 16%	75 55%
CSZ	67 28%	20 8%	149 63%	85 35%	22 9%	135 56%
Total	105 28%	40 11%	224 61%	124 33%	44 12%	210 56%

Other key questions in the 2014 survey in relation to respondents' production characteristics were:

What was the total number of sheep on the property at 30 June 2013, including lambs?

What is the total area, in hectares, that is grazed by sheep as pasture, standing green crops and stubbles, including all leased land?

Table 3 Average and median number of sheep per respondent and proportion of total number of WA sheep by zone

Zone	Average (2011)	% (2011)	Median (2011)	Average (2014)	% (2014)	Median (2014)
MRZ	5829	45	4600	5282	43	3250
CSZ	4095	55	3000	3913	57	3000
Total	4720		3500	4402		3000

Table 4 Average number and proportion of sheep by enterprise type for respondents to the 2014 and 2011 WA producer surveys

Enterprise type	Average (2011)	% (2011)	Median (2011)	Average (2014)	% (2014)	Median (2014)
Wool	4557	27%	3973	4517	33%	3200
Prime lamb	3635	8%	2650	2492	7%	1300
Wool and prime lamb	4990	64%	3900	4737	60%	3500

The average Western Australian flock size is 4402 sheep and the median flock size is 3000. The medium rainfall zone had a higher average number of sheep per farm (5282) than the cereal sheep zone (3913).

The average area for the sheep enterprise is 2303ha. The average amount of land allocated for grazing was larger in the cereal sheep zone (2911ha) than the average medium rainfall zone farm (1222ha).

Table 5 Average number and proportion of hectares of grazed area for respondents to the 2014 survey, by enterprise type and zone

Zone	WA average (ha)	WA %	Wool average (ha)	Wool %	Prime lamb average (ha)	Prime lamb %	Wool & prime lamb average (ha)	Wool & prime lamb %
MRZ	1222	19	1305	19	1068	32	1255	18
CSZ	2911	81	2682	81	2162	68	3289	82
Total	2303		2242	31	1628	8	2559	61

Table 5 shows the relative average areas in hectares allocated to grazing per property by each enterprise type and zone. The CSZ has larger grazing area with larger areas of stubble. Eighty one per cent of the grazing area can be found in the CSZ. Wool and prime lamb enterprise properties have the largest grazing areas and, in particular, in the CSZ. Sixty one per cent of the grazing area can be found on wool and prime lamb enterprises. In the MRZ the average grazed area of each enterprise type is far more similar. Prime lamb enterprises, regardless of zone, tend to have smaller grazing areas. Across the state, prime lamb producers have only 8% of the grazing area. Two thirds of that resides in the CSZ.

3.3 Dominant mating type

Key findings:

- Merino ewe flocks are 34% larger and the meat and maternal ewe flocks are 31% larger in the MRZ than the CSZ.
- The number of respondents with meat matings has reduced from 68% to 62%.
- The average number of Merino ewes mated has declined by 11%.
- The average number of meat and maternal ewes mated has declined by 14%.
- The average number of Merino ewes mated in the MRZ has declined by 15%.
- The average number of meat and maternal ewes mated in the MRZ has declined by 25%.
- The average number of meat and maternal lambs being turned off in the MRZ has only declined by 14%.
- The average number of Merino lambs being turned off in the CSZ has increased 6%.

As well as indicating their primary enterprise type, respondents were asked about the number of ewes mated to ram type. While many see Dohnes and SAMM merinos as dual-purpose breeds, they have been included in this survey in 'Merino rams'.

How many Merino ewes were mated to Merino rams, to lamb in 2013 (including Dohnes and SAMMs)?

How many Merino ewes were mated to meat or maternal rams to lamb in 2013?

How many meat or maternal ewes were mated to meat or maternal rams to lamb in 2013?

In 2011 there were only two questions asked;

How many ewes were mated to Merino rams, including Dohnes and SAMMs, to lamb in 2010?

How many ewes were mated to meat and maternal rams to lamb in 2010?

A 'mating type' rating was developed with the following parameters:

Merino if > 67% ewes were mated to Merino rams

Mixed if 33-67% ewes were mated to Merino rams

Meat if < 33% of ewes were mated to Merino rams

For the purposes of comparing the data the two 2014 survey questions relating to meat and maternal rams were combined and compared against the one response to the 2011 survey question on meat and maternal rams.

Among the respondents to the 2014 survey there were only 30 producers (8% of all respondents) that had no Merino ewes mated. The results from the 2011 and 2014 surveys are shown in Tables 6 and 7. None of the differences are significant.

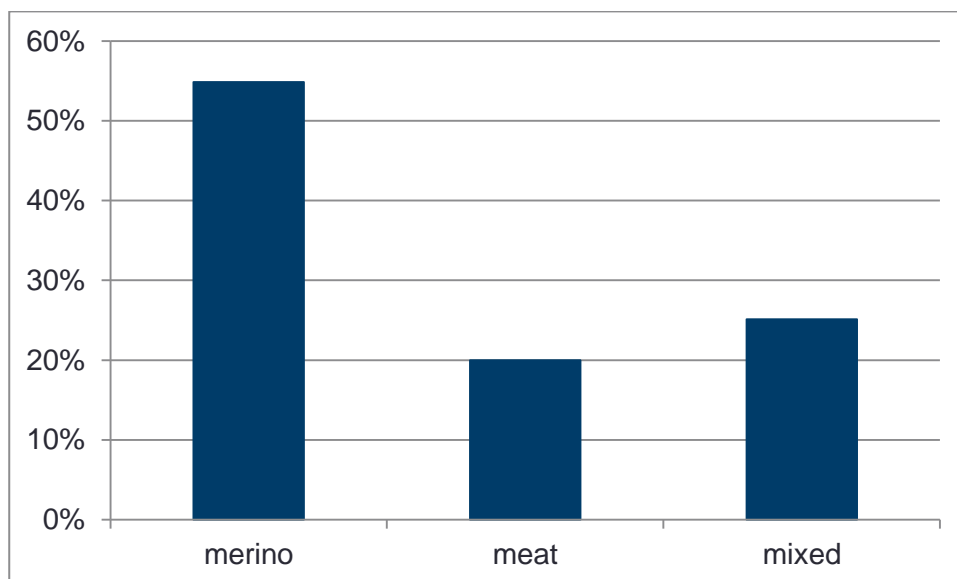


Figure 2 Dominant mating types (Merino sires, meat sires or mix of both Merino and meat sires) by respondent for 2014

Table 6 Matrix of enterprise type by proportion of ewe flock mated for wool, mixed and meat (2014 data)

Enterprise type	Merino (2014)	Mixed (2014)	Meat (2014)
Wool	88%	11%	2%
Prime lamb	9%	12%	79%
Wool and prime lamb	45%	36%	18%

Table 6 shows that while the dominant mating type for each enterprise reflects the enterprise type (e.g. 88% of all wool enterprise had 67% or more of their ewe flock as Merinos mated to Merino rams) other mating types play a considerable role in the make-up of any one enterprise type. Twenty one per cent of prime lamb producers have more than 33% of their ewe flock mated to Merinos. The 2011 survey revealed similar results.

Table 7 Producers mating ewes to produce Merino lambs in the 2010 and 2013 seasons

Zone	Number of producers (2011)	Average number of ewes mated (2011)	Average number of lambs (2011)	Number of producers (2014)	Average number of ewes mated (2014)	Average number of lambs (2014)	Change since 2011 for ewes	Change since 2011 for lambs
MRZ	105	2643	2131	97	2240	2095	(-15%)	(-2%)
CSZ	204	1783	1411	208	1671	1493	(-6%)	(+6%)
Total	309	2075	1656	305	1852	1679	(-11%)	(+1%)

The Merino ewe flocks were 34% larger in the MRZ than the CSZ in 2013 (48% larger in 2011) and the meat and maternal ewe flocks were 31% larger in the MRZ in 2013 (67% larger in 2011).

While there has not been any significant reduction in the number of producers mating ewes to Merino rams, the number of respondents mating ewes to meat rams has reduced from 68% (252/369) to 62% (234/378). There has also been a significant reduction in the average number of ewes mated between 2011 and 2014 for both Merinos (-11%) and meat sires (-14%). This reduction comes predominantly from the MRZ where the average number of matings to Merinos has decreased by 15% and the average number of matings to meat sires has decreased by 25%.

Despite that large reduction in numbers of ewes being mated, the number of lambs being turned off has not decreased to the same extent. The average number of Merino lambs being turned off has increased as a result of an increase in the number of lambs produced in the CSZ. The state average number of meat and maternal lambs per producer has declined to the same degree as the number of ewes mated. The considerable decline witnessed in the MRZ of 25%, however, has only resulted in a decline of 14% of lambs in this zone. Both the positive change in Merino lamb numbers and the limited decline of meat and maternal lamb numbers in the MRZ are likely to be influenced by the improved marking rates. As described in Chapter 5.1, the Merino marking percentage has improved by 6% to 90%. Meat and maternal marking per cent has also improved by a more conservative 3%.

4. Breeding strategies and behaviours

4.1 Breeding or selling rams

Key findings:

- The proportion of commercial producers that purchase rams to service their flock has declined from 76% in 2011 to 69% in 2014.
- The proportion of producers that do not breed or purchase rams or semen has increased from 2% in 2011 to 6% in 2014.
- Prime lamb producers are significantly more likely to breed rams for sale than either wool producers or wool and prime lamb producers.
- The proportion of wool producers that breed rams for themselves has increased from 28% to 42%.
- CSZ producers are more likely to buy rams in (73% as opposed to 61% in the MRZ).
- MRZ producers are more likely to breed rams for their own flock (45% as opposed to 30%).
- More MRZ producers are breeding their own rams than in 2011 (up to 45% from 30%) rather than buying rams (down from 76% to 61%).

Respondents were asked to identify their breeding practices and whether they purchased and/or sold rams as part of their sheep enterprise. They were allowed to select more than one response to allow for the identification of producers who sell and buy rams.

Do you run a commercial flock and buy rams?

Breed rams for your own commercial flock?

Breed rams for sale?

Do not breed/purchase rams or semen?

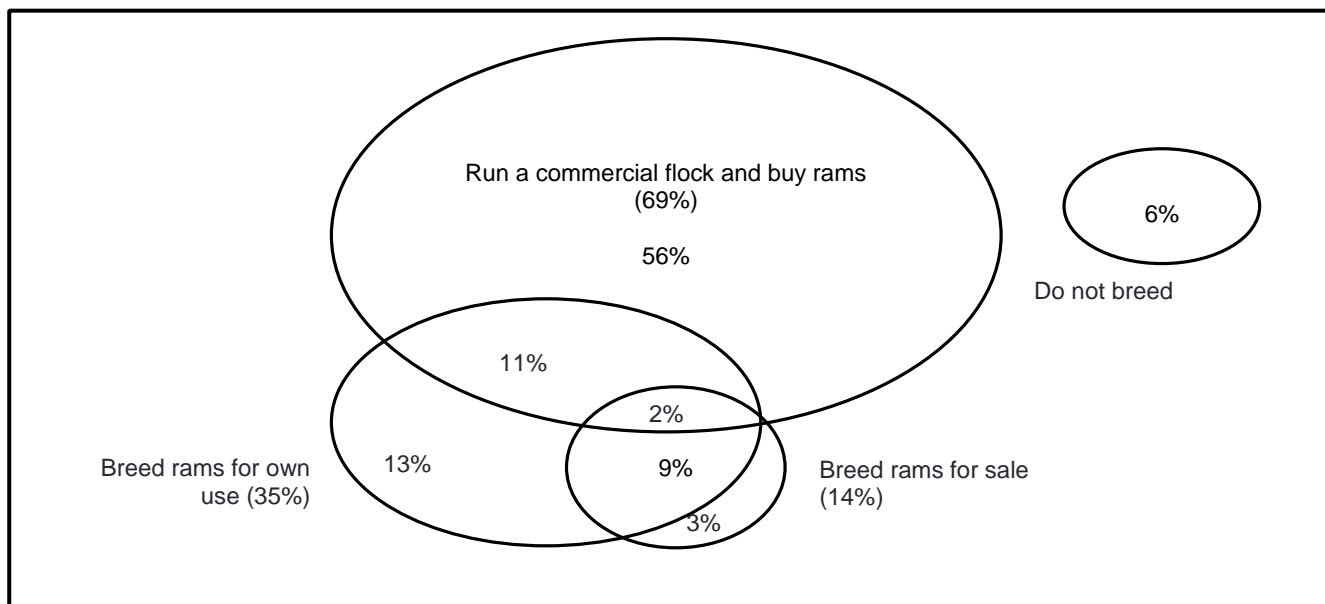


Figure 3 The proportion of producers who are ram breeders, buyers or sellers (2014 data)

The majority of producers buy some rams to service their flock (69%). This is a significant decline from 2011 where 76% of producers bought rams. Fourteen per cent of respondents can be classified as “ram sellers”, that is sell rams or semen to others. This has not significantly changed since 2011. Thirteen per cent both bought rams in for their commercial flock and bred rams either for their own use or for sale. Fifty six per cent of respondents ran a commercial flock and bought all their rams. Thirty five per cent of respondents bred rams for their own flock. This is also consistent with 2011 data. Some of these also sell rams. In total, 145 (38%) producers breed rams either for themselves or for sale.

The proportion of producers that say that they do not buy rams or semen has increased from 2% to 6%. This is consistent with the message that fewer commercial producers are buying rams. Together this may indicate that there are more producers involved in sheep trading or re-stocker lamb enterprises.

Table 8 Breakdown of breeding strategy based on whether producers buy or sell rams to others. (The figures marked with ‘a’ and ‘b’ differ significantly from each other. The figures marked with a ‘c’ differ significantly from the data collected in 2011)

Breeding strategy	Total	Wool producers	Prime lamb Producers	Wool and prime lamb producers
Run a commercial flock and buy rams	69%	67%	61%	71%
Breed rams for your own commercial flock	35%	42% ^c	34%	31%
Breed rams for sale	14%	15% ^b	30% ^a	10% ^b
Don't breed	6%	3%	2%	8%
<i>n</i> =	377	123	44	210

Prime lamb producers are much more likely to breed rams for sale than other enterprise types (30%). There is no significant difference between wool producers and wool and prime lamb producers on this behaviour. This is consistent with the data collected in 2011 where 25% of prime lamb producers, 15% of wool producers and 10% of wool and prime lamb producers bred rams for sale. The increase in proportion of prime lamb producers that breed rams for sale from 2011 to 2014 (25 to 30%) is not significant.

Table 9 Breakdown of survey respondents into breeding strategy categories by zone (2014 data only). (The figures marked with ‘a’ & ‘b’ between zones differ significantly from each other. The figures marked with a ‘c’ & ‘d’ differ significantly from the data collected in 2011)

Breeding strategy	MRZ (%)	CSZ (%)
Run a commercial flock and buy rams	61 ^{bc}	73 ^a
Breed rams for your own commercial flock	45 ^{ad}	30 ^b
Breed rams for sale	17	12
Don't breed	7	5
<i>n</i> =	136	242

There is a higher proportion of producers that buy rams in the CSZ (73% as opposed to 61%) and a higher proportion of producers that breed rams for their own flock in the MRZ (45% as opposed to 30%).

There have also been some shifts between 2011 and 2014. The proportion of wool producers that breed rams for their own flock has increased from 28% in 2011 to 42% in 2014. Also, within the MRZ, there are significantly less producers buying rams (from 76% to 61%) and more producers breeding their own rams (up to 45% from 30%)

This data indicates that, while there has not been a decrease in the number of ram sellers, there has been a decrease in the demand for rams by commercial producers. This is reflected in the decreased number of rams sold by breeders (see chapter 4.5) and may indicate that ram breeders are earning less and, hence, less able to invest in training and business development.

4.2 Stud and ram selection

Key findings:

- Producers in the MRZ are more likely than producers in the CSZ to use genetic information when selecting a ram source (26% compared to 15%).
- Wool producers are more likely than lamb producers to select a ram source based on advice from their agent or classer (17% compared to 4%).
- Nineteen per cent of producers (6% more than in 2011) use genetic information such as ASBVs or indexes to select a breeder that matches their breeding objective.
- Producers (overall) are less likely to select rams from their regular ram source (50% in 2011 compared to 36% in 2014).
- Thirty eight per cent of producers that have always gone to the same stud source do so because they have assessed their studs performance data at some stage and have not seen the need to reassess.
- Fewer producers select rams mainly on visual appeal (8% in 2014 compared to 16% in 2011).
- The proportion of ram buyers that select rams based on some level of performance data or genetic information has increased from 74% in 2011 to 85% in 2014.
- Prime lamb producers are still much more likely than wool producers to select rams based on how they look (19% of prime lamb producers compared to 6% of wool producers).

The questions in this section were only asked of those respondents that bought in rams, which included ram breeders. Only one answer was allowed per respondent. Responses to the questions on ram source and ram selection methodology can be compared with data collected in 2011.

Selection of stud or ram source

Which one of the following statements best describes how you usually select your stud or ram source for your primary sheep enterprise?

I have never considered going to anyone other than my regular stud breeder.

I choose a stud breeder based on advice from my classer, agent or consultant.

I usually go to the ram sales or shows and select a stud that suits my needs.

I review wether trial data, sire evaluation data, sale reports etc. and select a stud breeder that is performing well.

I use ASBVs or information from Sheep Genetics and/or selection indexes to select a breeder that matches my breeding objective.

In this question there was a slight change to the phrasing of the last option involving the use of ASBVs. In 2011 that option was phrased “I access genetic information from sources such as Sheep Genetics or Australian Merino Sire Evaluation Association and select a breeder based on their match to my breeding objective”.

Table 10 Strategies for selecting a stud source by producers who purchase rams (2014 data). (Figures marked with ‘a’ & ‘b’ indicate the only significant differences between zones, while figures marked with ‘x’ & ‘y’ indicate the only significant differences between enterprise types)

Selecting a stud or ram source	Total %	MRZ %	CRZ %	Wool %	Prime lamb %	Wool & prime lamb %
Regular stud breeder only	36	37	36	40	38	33
Advice of classer or agent	15	11	17	17 ^y	4 ^x	16
Select from ram sales	23	20	25	20	23	25
Performance data	7	7	7	8	15	5
Genetic information	19	26 ^a	15 ^b	14	19	21
n=	259	82	177	83	26	150

Producers in the MRZ are significantly more likely to use genetic information when selecting a ram source than producers in the CSZ (26% compared to 15%). This equates to 171 717 sheep in the MRZ and 93 150 sheep in the CSZ subject to a breeding strategy that utilises ASBVs.

In comparing enterprise types, there are no significant differences between wool and prime lamb producers and prime lamb producers, or wool and wool and prime lamb producers. However there is a significant difference between prime lamb and wool enterprises in that wool producers are more likely to take the advice of a classer or agent.

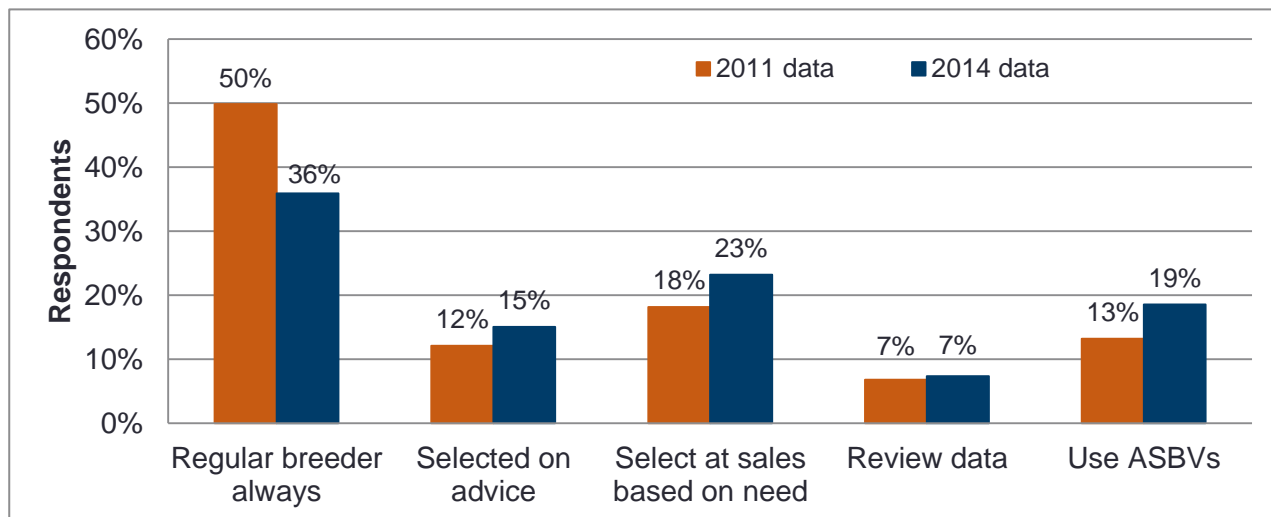


Figure 4 The change in proportion of producers that implement each stud selection strategy between 2011 and 2014

The figures indicating that there were far less producers in 2014 choosing to select their rams from their regular breeders is significant at $p < 0.05$. The 6% increase in the use of ASBVs is also significant at $p < 0.10$. The increase in proportion of producers that attend ram sales or shows and selecting their ram source based on need is only just not significant at $p < 0.10$. With these confidence levels it does still appear that there has been a general shift in favour of more proactive methods of selecting ram source.

To further understand the motivations for those producers that never consider going to anyone other than their regular stud breeder, a follow up question was asked for the first time in 2014.

Which one of the following statements describes the main reason for never considering anyone other than your regular stud breeder?

My stud breeder is conveniently located to my property.

I have a good relationship with my stud breeder.

I am confident that my stud breeder sells rams that perform well.

I determined years ago to purchase from my regular breeder based on performance data and have never had cause to change this decision.

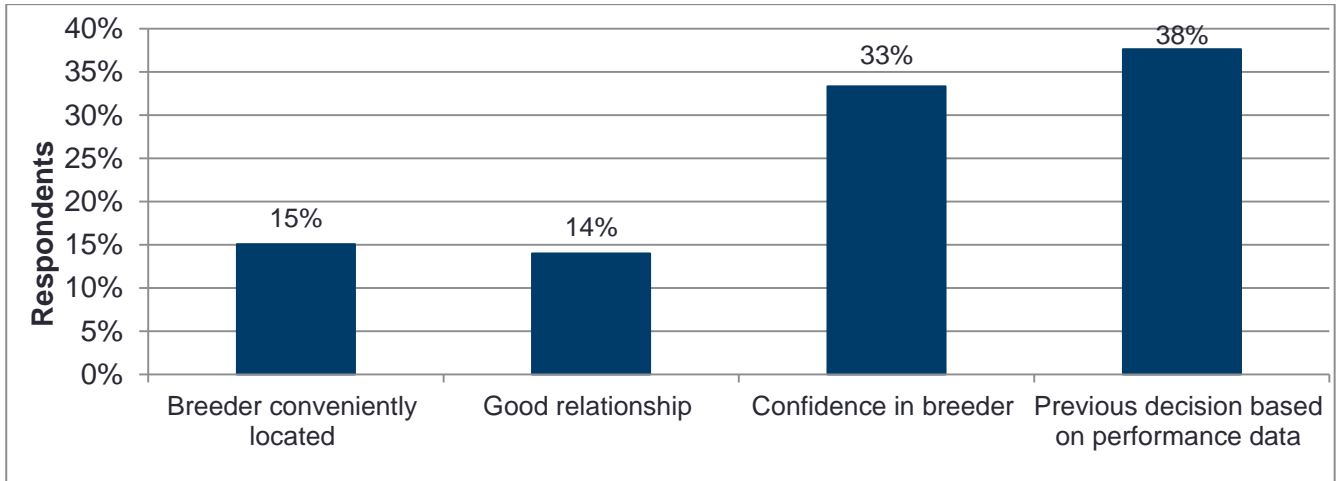


Figure 5 The reasons provided by producers as to why never considering using any other ram source than their regular supplier (2014 data; n=93)

The results, as seen in the Figure 5, show that 38% of producers that never consider going to anyone other than their regular stud breeder do so because they have at some point considered their decision objectively.

Selection of rams

Which one of the following statements best describes how you select rams to buy?

My classer or agent chooses the rams.

I choose the rams based on how they look.

I choose rams mainly on how they look but use some performance data such as fibre diameter, live weight or eye muscle depth.

I choose rams with a balance of visual appeal, performance data and some genetic information such as ASBVs or breeding values.

I choose rams based on genetic information such as ASBVs, breeding values or selection indexes.

Most ram buyers (77%) chose their rams with some combination of how they look and some performance data. This has increased from 70% in 2011. In 2014, 49% of producers use genetic information (either primarily or in combination with other methods) to select their rams. This has also increased from 42% in 2011. Both of these changes are significant at $p < 0.10$.

Table 11 Strategies for selecting a ram by producers who purchase rams (2014 data). (The figures marked with an 'a' and 'b' indicate the only significant differences between enterprises within that response)

Ram selection	Total %	Wool %	Prime lamb %	Wool & prime lamb %
Classer or agent chooses rams	7%	7%	7%	7%
Choose rams based on look	8%	6% ^b	19% ^a	7%
Choose rams mainly on look and some performance data	36%	35%	26%	38%
Choose rams on look, performance data plus some genetic info	41%	40%	37%	42%
Choose rams based on genetic information	8%	12%	11%	5%

Between enterprise types, the only significant difference occurs between wool and prime lamb enterprises where producers select rams primarily on how they look. Prime lamb enterprises are more inclined (19%) to select rams this way compared to wool enterprises (6%). In the report on

the 2011 data it was reported that 36% of prime lamb producers selected rams based on how they look. This is not a significant difference and the number of producers that identified themselves as running a prime lamb enterprise was quite small in both samples.

In the period between 2011 and 2014 the method of ram selection had not changed greatly. The only significant difference between years was that fewer producers select mainly on visual appeal. In 2011 16% of producers said that this was their main method of selection, while in 2014 8% said that they did this.

Figure 6 indicates that there has been a shift toward the use of performance data or genetic information. The proportion of producers that choose rams primarily based on how they look has halved from 16% to 8% ($p < 0.05$) and the proportion of producers that choose rams based on genetic information has doubled from 4% to 8% ($p < 0.10$). There has also been a significant increase in the proportion of producers that select rams using either or performance data or genetic information. In 2011, 74% of producers selected rams based on some level of performance data or genetic information, while in 2014 85% of producers that bought rams used performance data or genetic information to some degree. This equates to an 8% increase in the proportion of respondents ewes being mated to objectively selected rams (for those respondents that buy rams in). This means that 86% of ewes were mated to a ram selected on either performance data or genetic information in 2013, while 78% of ewes were mated to rams selected this way in 2010.

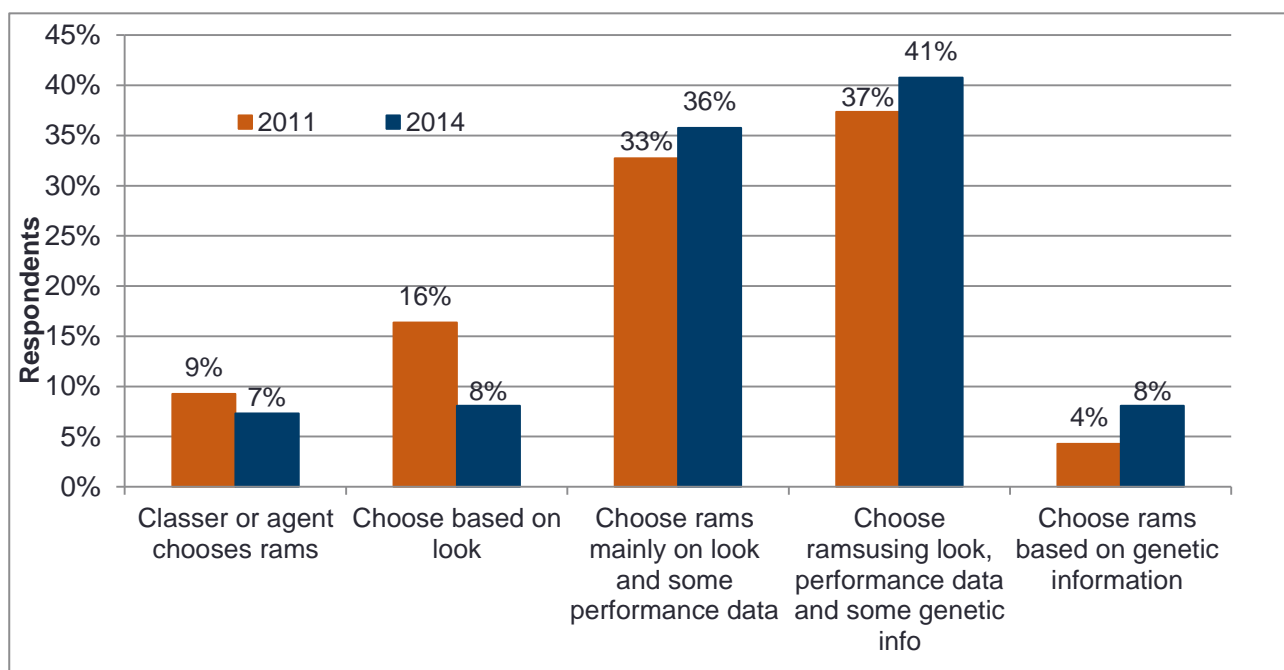


Figure 6 The change in proportion of producers that implement each ram selection strategy between 2011 and 2014

4.3 Importance of selection traits

Key findings:

- Muscling and plain body traits were rated the most important traits (52%).
- Between 37% and 52% of all producers thought that the traits listed were more important in 2014 than they were five years earlier.
- Parasite resistance and dag score attracted relatively lower increases in importance (37% and 38% respectively)
- More producers in the medium rainfall zone consider parasite resistance to be more important in 2014 than five years earlier (48% in MRZ compared to 30% in CSZ).

- Fewer prime lamb producers (than wool and prime lamb producers and all other producers respectively) have expressed that dag score and plain body traits are more important than five years prior.
- 20% more wool and prime lamb producers than wool producers believe that muscling and fatness traits are more important than five years ago (59% and 47% respectively for wool and prime lamb producers).

When selecting your replacement rams, do you consider the following traits to be more, less, or just as important than you did five years ago?

Lamb weaning percentage or ASBV for number lambs weaned.

Parasites resistance or ASBV for worm egg count.

Plain body or ASBV for early breach wrinkle score.

Dags or ASBV for dag score.

Muscling or ASBV for eye muscle depth.

Fatness or ASBV for fatness.

Table 12 Change in the importance of traits by all producers (2014 data; n=367)

Traits	More important	Just as important	Less important
Muscling or ASBV for eye muscle depth	52%	38%	10%
Plain body or ASBV for early breach wrinkle score	52%	37%	11%
Fatness or ASBV for fatness	40%	48%	13%
Lamb weaning percentage or ASBV for number lambs weaned	39%	54%	7%
Dags or ASBV for dag score	38%	50%	13%
Parasites resistance or ASBV for worm egg count	37%	52%	11%

In 2014, all of the traits were more important to the general population of producers than five years ago. A greater number of producers considered the muscling and plain body traits to have increased in importance in that time than the other traits listed (52%). Parasite resistance and dag score attracted relatively lower increases in importance (37% and 38% respectively).

The only significant difference between production zones occurs on the attitude to parasite resistance or ASBV for worm egg count. In the CSZ, 57% of producers consider parasite resistance to be just as important as it was in 2011 and 30% consider it to be more important. In the MRZ 44% consider it to be just as important and 48% consider it to be more important.

Table 13 Proportion of producers that believe each trait is more important in 2014 than it was in 2011. (The figures marked with an 'a' and 'b' are significantly different to each other within each trait)

Traits	Wool producers	Prime lamb producers	Wool and prime lamb producers
Lamb weaning percentage/ASBV for number lambs weaned	34%	39%	42%
Parasites resistance/ASBV for worm egg count	32%	34%	40%
Plain body/ASBV for early breach wrinkle score	53% ^a	34% ^b	55% ^a
Dags/ASBV for dag score	35%	24% ^b	42% ^a
Muscling/ASBV for eye muscle depth	39% ^b	56%	59% ^a
Fatness/ASBV for fatness	26% ^b	44%	47% ^a
n=	122	41	204

Prime lamb producers differ from other enterprise types in that a smaller proportion of them consider that the trait for plain body is as important as it was five years ago. Prime lamb producers also differ from wool and prime lamb producers on dag score (less important). Wool producers and wool and prime lamb producers differ in their position on muscling and fatness. A considerably higher proportion of wool and prime lamb producers believe these traits to be more important than they were, compared to wool producers (in the order of +20%).

4.4 Knowledge of Australian Sheep Breeding Values

Key findings:

- The proportion of Western Australian producers that haven't heard of ASBVs has decreased from 20% to 13% (although only 7% of producers nationally haven't heard of ASBVs).
- Fewer Western Australian producers (4%) consider that they have a detailed knowledge of ASBVs than producers nationally (9%).

The 2014 producer survey included a question on knowledge of ASBVs.

Which one of the following statements best describes your current level of knowledge of Australian Sheep Breeding Values (ASBVs)?

I have never heard of ASBVs.

I have heard of ASBVs but don't understand them.

I have a basic understanding of ASBVs.

I have a good understanding of ASBVs.

I have a detailed knowledge of ASBVs.

This question was not asked in the 2011 producer survey, however it had been asked by Curtis¹ in 2009. Comparing the Western Australian component of the 2009 survey ($n=122$) shows that there has been a 7% decrease in proportion of producers that have never heard of ASBVs ($p<0.10$) and a 10% increase in the proportion of producers that have heard of but don't understand ASBVs ($p<0.05$).

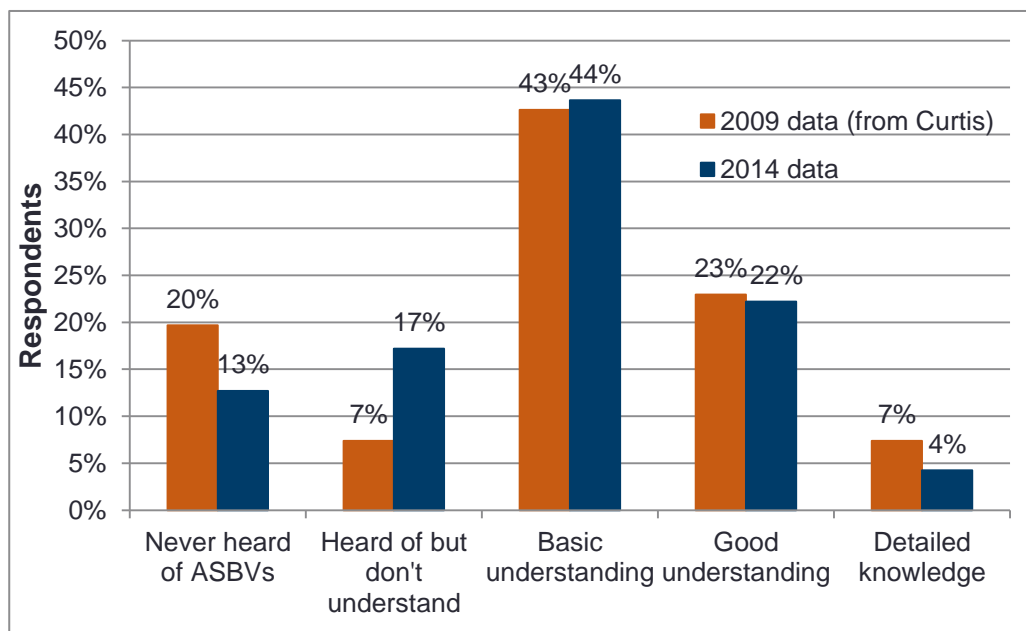


Figure 7 Comparison of Western Australian producers understanding of ASBVs (2009 and 2014 data)

When comparing the responses of Western Australian producers against producers nationally there are two significant differences. More Western Australian producers have not heard of ASBVs (13% of Western Australian producers compared to 8% nationally) and fewer Western Australian

producers consider themselves to have a detailed knowledge of ASBVs (4% compared to 9% nationally).

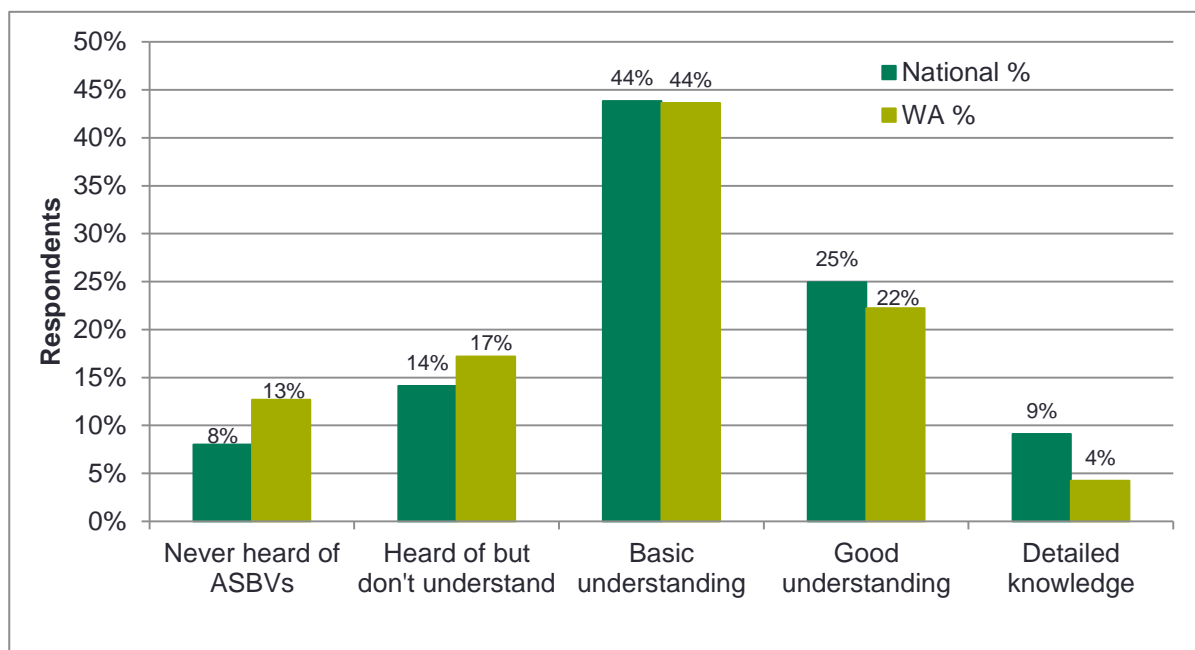


Figure 8 Comparison of Australian producers and Western Australian producers understanding of ASBVs (2014 data)

4.5 Sale of rams and use of Australian Sheep Breeding Values

Key findings:

- Thirty six per cent of ram breeders (with 50% of all rams sold) sell all of their rams with ASBVs.
- More than 50% of the larger ram sellers sell all of their rams with ASBVs.
- Forty nine per cent of all rams sold by Western Australian ram breeders are sold with ASBVs.

Producers that answered yes to the question on whether they bred rams for sale (of which there were 53 in 2014) were asked the questions:

How many rams did you sell in 2013?

What percentage of the rams that you sold (or sold semen from) in 2013 had Australian Sheep Breeding Values (ASBVs)?

The same questions were asked in 2011 (in reference to the 2010 year) with the minor change in phrasing from “what proportion” to “what percentage” in the second question.

In 2011, 12.5% of respondents sold rams, with an average of 123 rams sold in 2010 and a median of 71 rams. The 2014 survey found that 14% of producers sold rams, with an average of 104 rams and a median of 75. These figures are not significantly different from the 2011 figures.

Table 14 Comparison of number and scale of Western Australian ram sellers that have either 100% of their rams sold with ASBVs or none of their rams sold with ASBVs (2011 and 2014 data)

Metric	2011 number	2011 %	2014 number (WA)	2014 % (WA)	National %
100% ASBVs - ram sellers	14	33%	17	36%	34%
No ASBVs - ram sellers	28	67%	30	64%	66%
100% ASBVs - average rams	180		141		154
No ASBVs - average rams	97		80		69
100% ASBVs - total rams	2520	48%	2396	50%	47%
No ASBVs - total rams	2710	52%	2395	50%	53%

Of the 53 ram breeders, six had ASBVs on a proportion of their flock (three of whom didn't know what proportion of rams they'd sold had ASBVs). Removing those producers that didn't know how many of their rams had ASBVs from the results and the total number of rams sold with ASBVs is calculated to be 2656 or 49% of all rams sold from our sample of producers. These rams are sold from 40% of all ram breeders.

Table 15 shows more than 50% of the larger breeders sell all of their rams with ASBVs. There is no significantly different change in number of producers within each volume group since 2011.

Table 15 Number of WA producers that sell rams, grouped by volume of rams sold (2011 and 2014 data)

Rams sold	Ram sellers (2011)	Ram sellers (2014)	% of breeders that sell 100% of their rams with ASBVs (2011)	% of breeders that sell 100% of their rams with ASBVs (2014)
3 - 50	18	19	30%	17%
51 - 100	10	14	29%	24%
101 - 200	11	13	32%	51%
200 - 600	7	7	63%	54%
Total	46	53	46%	44%

As mentioned in Chapter 4.1, the downturn in demand for rams by commercial producers has had an impact on the number of rams sold in 2013. The implication maybe that ram breeders are earning less and, hence, less able to invest in measurement, technology and training.

4.6 Labour saving devices

Key findings within this chapter:

- Eight per cent of producers use automatic drafting equipment; 13% (down from 20%) are considering it.
- Four per cent of producers use electronic ear tags; 16% (down from 20%) are considering it.

Questions about labour saving devices were asked in both the 2011 and 2014 producer surveys. While the scope of the questions was the same in each survey there was a change in format of the questions between surveys. In 2011 the question was asked "When working with sheep, do you currently use any of the following devices?" If respondents answered "no" then they were then asked "Are you considering using any of these devices?" In 2014, survey participants were asked first if they had heard of the listed devices and, secondly, if there were considering, not considering or already using them. The list of devices also changed. In 2011 producers were asked about seven different devices, while in 2014 the list consisted of four, with only two devices existing on both surveys (automatic drafting equipment and electronic ear tagging). The table below shows the producers responses to all of the devices included in the 2014 survey with the comparative responses on those devices included on both surveys.

Table 16 The proportion of respondents that use or are considering using sheep handling devices (2011 and 2014 data). (The figures marked with ‘a’ and ‘b’ are significantly different)

Devices	Heard of in 2014	Using in 2014	Considering using in 2014	Using in 2011	Considering using in 2011
Automatic drafting equipment	93%	8%	13% ^b	6%	20% ^a
Electronic ear tags	96%	4%	16%	4%	20%
Walk over weighing system	53%	2%	7%	-	-
Pedigree MatchMaker	19%	1%	4%	-	-

These results show that almost all Western Australian producers are aware of the existence of automatic drafting equipment and electronic ear tags, while walk over weighing systems and Pedigree MatchMaker are far less known. The number of producers using automatic drafting equipment and electronic ear tags has not significantly changed in the three years between the two surveys. The number of producers considering using electronic ear tags has not significantly changed, but the number of producers considering using automatic drafting equipment has significantly declined (-7%).

Table 17 The proportion of respondents that use or are considering using sheep handling devices by zone (2014 data only). (The figures marked with ‘a’ and ‘b’ are significantly different)

Devices	Heard of (MRZ)	Heard of (CSZ)	Using (MRZ)	Using (CSZ)
Automatic drafting equipment	93%	93%	8%	8%
Electronic ear tags	97%	96%	6%	3%
Walk over weighing system	62% ^a	48% ^b	1%	2%
Pedigree MatchMaker	24% ^a	17% ^b	1%	1%

There is a difference between the zones in terms of the proportion of producers that have heard of some of these labour saving devices. Fourteen per cent more of the MRZ producers have heard of the walk over weighing system and 7% more of the MRZ producers have heard of Pedigree MatchMaker. There are no significant differences in the level of adoption in either zone.

5. Reproduction and welfare

5.1 Reproduction

Key findings:

- The proportion of producers with mating ewes to meat and maternal sires has decreased from 68% to 62%. The proportion of producers mating ewes to Merino remains the same.
- The average number of ewes being mated per producer has declined by 11% for Merino and 14% for meat and maternal since 2011.
- The reduction in number of ewes being mated comes from the MRZ (Merino mating down 15% and meat mating down 25% in this zone).
- Marking percentage has improved for Merino matings by 6% to 90%, and by 3% to 95% for meat and maternal matings since 2011.
- The gap between marking percentage for meat and Merino ewes is closing (was 8% higher, now only 5% higher).

In the 2014 survey the following questions were asked about mating.

How many Merino ewes were mated to Merino rams, to lamb in 2013 (including Dohnes and SAMMs)?

How many Merino ewes were mated to meat or maternal rams to lamb in 2013?

How many meat or maternal ewes were mated to meat or maternal rams to lamb in 2013?

Similar questions were asked in the 2011 survey except that there were only two questions asked which focused on the type of ram used rather than the ewe.

How many ewes were mated to Merino rams, including Dohnes and SAMM's to lamb in 2010?

How many ewes were mated to meat and maternal rams to lamb in 2010?

The results of the two sets of questions are comparable if the responses to the two questions about meat and maternal rams asked in 2014 are combined to compare with the one question asked in 2011.

The marking rate for both years is shown on Table 18. Marking rate has been calculated in both years by:

- calculating the marking percentage for each individual using the ewe and lamb figures provided by the respondents for each mating type
- removing any calculated marking percentage that fell outside the range 50-150%
- taking the average of these marking percentages.

Table 18 Average marking percentage for producers mating ewes to Merino rams and meat and maternal rams in the 2010 and 2013 seasons

Type	Number of producers (2011)	Average ewes mated (2011)	Marking % (2011)	Number of producers (2014)	Average ewes mated (2014)	Marking % (2014)
Merino	309	2075	84%	305	1852	90%
Meat & maternal	252	1372	92%	234	1180	95%

Between 2011 and 2014 the marking rate has increased within each mating type. In 2011 the Merino mating marking percentage was 84%. This has increased to 90% (significant at $p < 0.05$). In 2011 the meat mating marking percentage was 92%. This has increased to 95% (significant at $p < 0.10$). There continues to be a significant difference between the marking percentage for Merino mating and meat mating for each year. In 2011, the marking percentage for meat mating was 8% higher than for Merino mating. In 2014, the marking percentage for meat mating was 5% higher than for Merino mating.

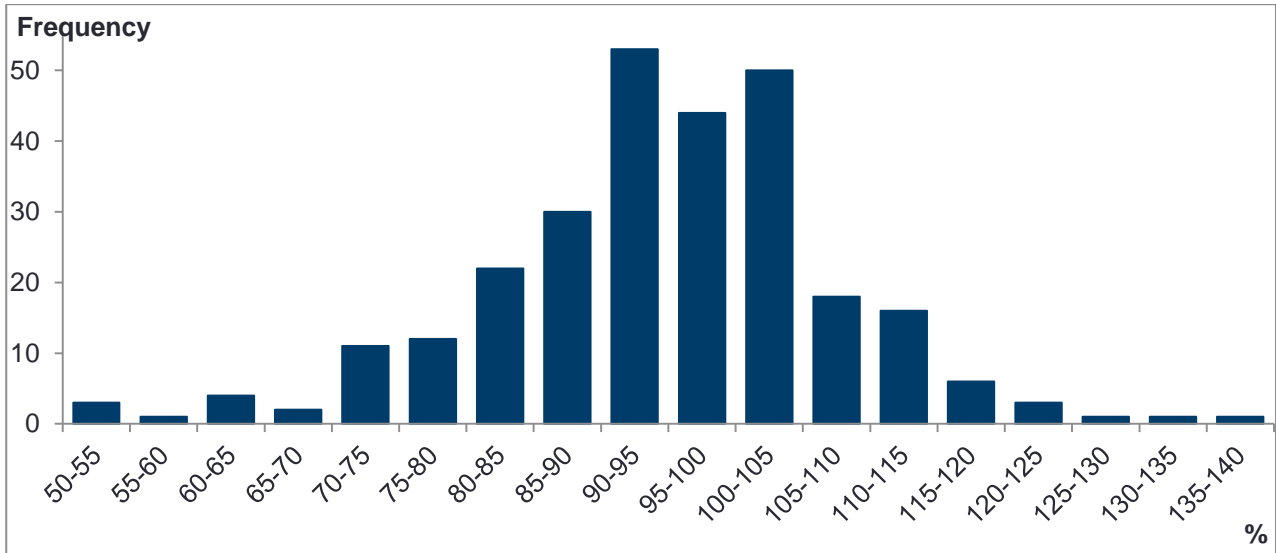


Figure 9 Histogram of marking rates for Merino ewes mated to Merino rams grouped into ranges of 5% (2014 data)

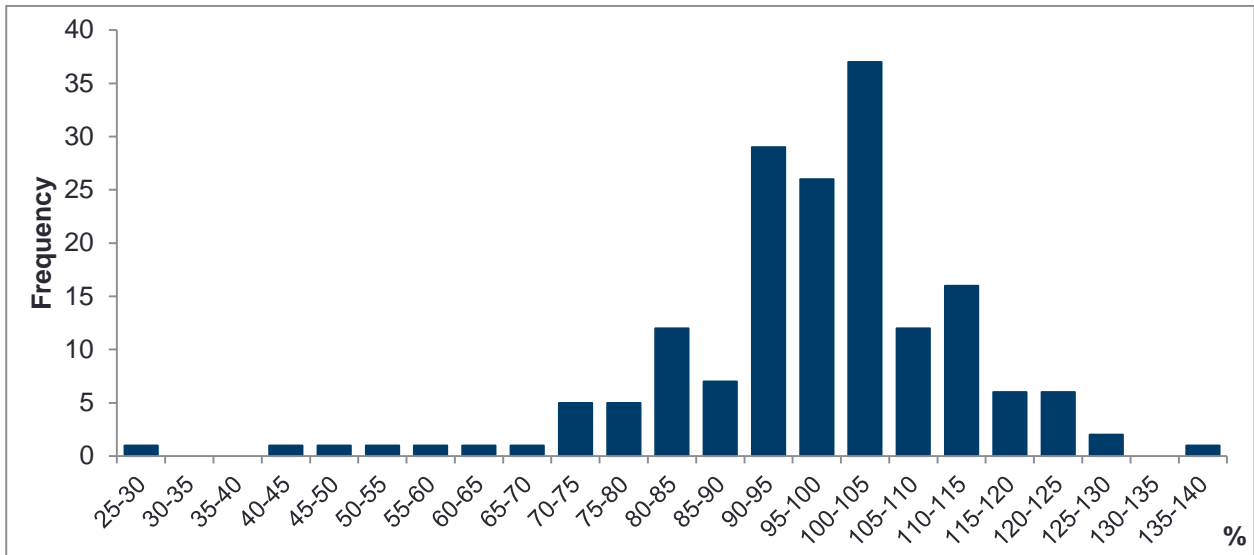


Figure 10 Histogram of marking rates for Merino ewes mated to meat and maternal rams grouped into ranges of 5% (2014 data)

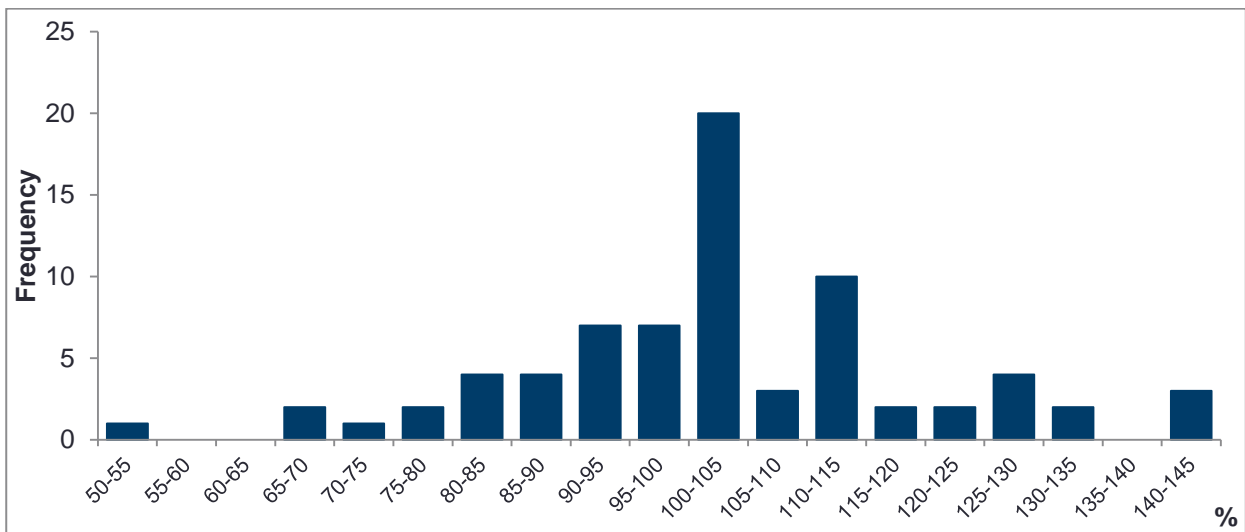


Figure 11 Histogram of marking rates for meat and maternal ewes mated to meat and maternal rams grouped into ranges of 5% (2014 data)

The histograms (figures 9, 10, 11) show the frequency of individual marking percentages grouped into 5% ranges. These figures include all calculated marking percentages (that is, no 50-150% limit has been applied) except where the calculated marking percentage was more than 15% different from the respondents' stated marking percentage. These have been excluded.

Figure 9 indicates that the results show a normal distribution with an average marking percentage of 90% for Merino matings. The merino to meat and maternal matings (Figure 10) shows a more variable distribution with a proportion of producers attracting very low marking percentages. The average marking percentage is 94%. Figure 11 shows a less varied data set with high frequency around 100% marking rate but an average marking percentage of 97%.

5.2 Pregnancy scanning

Key findings within this chapter:

- Pregnancy scanning is a practice carried out routinely by 40% of respondents, of which 14% scan for litter size.
- Forty one per cent of prime lamb producers scan for pregnancy, down from 67% in 2011.
- Producers with the largest flocks are much more inclined to scan than the producers with the smallest flocks (74% compared to 35% in 2014).
- Producers with the largest flocks are now more likely to scan for multiple (from 14% in 2011 to 29% in 2014) rather than status (down from 45% to 28%).
- At 50%, 7% fewer Western Australian than national producers pregnancy scan.
- At 14%, 11% fewer Western Australian than national producers scan for litter size.
- The average marking percentage is 5% higher for Merino producers that scan and 4% higher for meat producers that scan (as opposed to those that don't).
- Sixty one per cent of producers that scan manage their dry, single and twin bearing ewes on individual need.
- The proportion of producers that don't change their nutritional management practice according to scanning results has reduced from 11% to 5%.
- Ninety four per cent (up from 74%) of producers that scan for litter size manage their flock in groups based on need, while 4% (down from 20%) manage as one homogenous group.
- The average scanning percentage for Merino mating is 120%.

The 2014 survey included a question to all respondents about pregnancy scanning.

Which one of the following statements best describes how you use pregnancy scanning to manage the nutrition of ewe flocks, do you:

- choose not to use pregnancy scanning**
- only scan in bad years on some sheep**
- scan ewes only for pregnancy status (pregnant or not)**
- scan ewes to detect litter size.**

Pregnancy scanning is a practice carried out by 40% of respondents routinely, of which 14% scan for litter size. A further 10% said that they scan in bad years. This is not significantly different than the data collected in 2011.

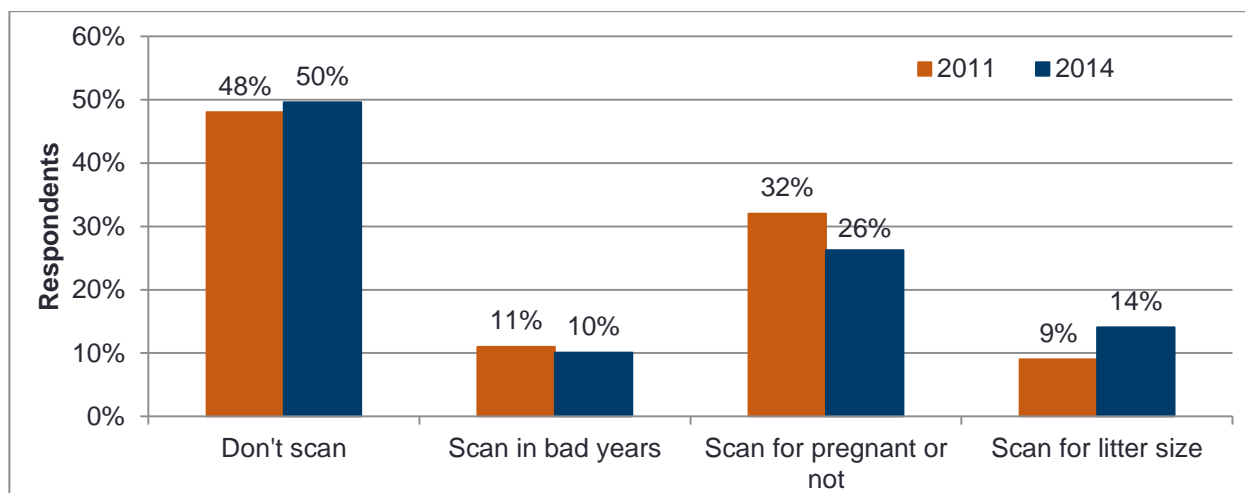


Figure 12 Pregnancy scanning practices undertaken by Western Australian producers (2011 and 2014 data)

There was no significant difference in the number of producers scanning between zones or enterprises in 2014. When comparing 2011 and 2014 data, prime lamb producers have become much more inclined to not scan at all. There has been 20% decline in number of producers scanning for pregnancy status (from 40% to 20%) and an increase of 26% of producers choosing not to scan at all (59% in 2014 from 33% in 2011). There was no other significant change within other enterprise types.

However, there is a significant (5%) increase in number of producers scanning for litter size at a state level. There appear to be small but insignificant increases in the number of producers now scanning for litter size across all enterprise types.

Table 19 The proportion of respondents that pregnancy scan regularly, occasionally or not at all (2011 and 2014 data). (The figures marked with 'a' and 'b' are the year-to-year comparisons that are significantly different. Then figures marked with 'i' and 'ii' within 2014 are significantly different. Confidence level $p < 0.10$.)

Pregnancy scanning	Wool 2011	Prime lamb 2011	Wool & prime lamb 2011	WA 2011	National 2011	Wool 2014	Prime lamb 2014	Wool & prime lamb 2014	WA 2014	National 2014
Don't scan	57%	33% ^b	46%	48%	47%	55%	59% ^a	44%	50% ⁱ	43% ⁱⁱ
Scan bad years only	10%	15%	11%	11%	9%	10%	5%	11%	10% ⁱ	7% ⁱⁱ
Scan pregnant or not	26%	40% ^a	33%	32%	26%	24%	20% ^b	29%	26%	25%
Scan: litter size	7%	13%	10%	9% ^b	18%	11%	16%	15%	14% ⁱⁱ _a	25% ⁱ
<i>n</i>	105	40	224	369	994	123	44	210	377	994

A comparison with the national data shows that Western Australian producers are less likely to scan for pregnancy than others. Western Australian producers are much less likely to scan at all (7%), scan in bad years (-3%) or to scan for litter size (-11%). Nationally, producers are more inclined to scan their ewe flock than they were three years prior, particularly for litter size. Western Australian producers have not changed in this regard.

The 2011 WA survey and 2014 national survey both report that there is a strong correlation between flock size and scanning practices. Producers with the largest flocks are much more inclined to scan than the producers with the smallest flocks (Table 20). While there has not been any increase, in any quartile in the proportion of producers who don't scan, the producers with the largest flock have made significant changes in the type of scanning that they undertake. Only 14%

of producers with the largest flocks scanned for multiples in 2011. This has more than doubled to 29% in 2014. This seems to have come entirely from producers that used to scan only for wet and dry previously (28% in 2014, down from 45% in 2011).

Table 20 Usual pregnancy scanning practice broken down into flock size quartiles (2011 and 2014 data). Note: 1 is the smallest, 4 is the biggest. (The figures marked with a superscript 'a' or 'b' are the only year-to-year comparison figures that are significantly different)

Flock size quartile	1 (2011)	2	3	4	1 (2014)	2	3	4
Don't scan	67%	55%	46%	22%	65%	61%	45%	25%
Scan: bad years only	5%	8%	13%	19%	5%	9%	9%	17%
Scan: pregnant or not	22%	27%	33%	45% ^a	24%	20%	34%	28% ^b
Scan: litter size	5%	11%	8%	14% ^b	6%	9%	12%	29% ^a

Regardless of mating type, higher marking rates are achieved by those producers that scanning for pregnancy (see Table 21). Pregnancy scanning is a useful tool for improving the reproductive efficiency of the flock.

Table 21 Pregnancy scanning practices and the average marking percentages for each mating type. Note: the marking percentage was calculated using individual marking percentages with values outside of the range of 50-150% removed. (The figures marked with 'a' & 'b' are significantly different at p<0.05. The figures marked with 'x' & 'y' are significantly different at p<0.10.)

Mating type	Total	Don't scan or scan in bad years	Scan for pregnancy or litter size
Average Marking % - Merino	90%	88% ^b	93% ^a
Average Marking % - meat	95%	93% ^y	97% ^x

Management of ewe nutrition using pregnancy scanning status

Producers that responded that they either scan for pregnancy status or litter size were also asked what they did with that information. This question was also asked in the 2011 survey.

Which one of the following statements best describes what you do with the pregnancy scanning information?

I don't change my nutritional management.

I manage ewes according to their energy requirements as a single group.

I manage dry, single and twin bearing ewes separately and according to their different energy requirements.

Table 22 Management practices of 2014 and 2011 survey respondents who scanned for status and or litter size, including breakdown by zone for 2014 survey only. (The figures marked with a superscript 'a' and 'b' are the only figures that are significantly different.)

Production zone	Survey total	Don't change	Manage as a group	Manage individually
MRZ	57	2%	30%	68%
CSZ	94	6%	37%	56%
All scanned (2014)	151	5% ^b	34%	61%
All scanned (2011)	152	11% ^a	35%	54%

There was no significant difference ($p < 0.10$) between management practices between zones (in 2011 there was an observation that more MRZ producers managed their flocks separately than the CSZ). Between the 2011 and the 2014 surveys there are fewer producers that don't change their nutritional management practices based pregnancy scanning information. This was the only significantly different result between 2011 and 2014.

Table 23 Management of pregnant ewes, according to pregnancy scanning information (comparison of 2011 and 2014 data). (The figures marked with a superscript 'a' and 'b' are the only figures that are significantly different between 2011 and 2014)

Respondents scanning for litter size	2011	2014
I don't change my nutritional management	6%	2%
I manage ewes according to their energy requirements as a single group	20% ^a	4% ^b
I manage dry, single and twin bearing ewes separately and according to their different energy requirements	74% ^b	94% ^a
<i>n</i> =	35	53

Of those that are scanning for litter size, many more (94%) are now managing their dry, single and twin bearing ewes based on their individual needs. Only 74% of this group did this in 2011. As we know that a larger proportion of producers that scan for litter size are larger producers, this management is being applied to a larger proportion of the flock than is indicated by the producer numbers.

2013 reproductive rate and pregnancy scanning

Reproductive rate is determined by the number of foetuses per 100 ewes and is often known as the scanning percentage.

Did you pregnancy scan any ewes that lambed in 2013?

What was the scanning percentage (number of foetuses scanned per 100 ewes joined) for adult Merino ewes scanned in 2013?

What was the scanning percentage (number of foetuses scanned per 100 ewes joined) for adult Meat or maternal ewes scanned in 2013?

Respondents to the 2014 survey that said that they conduct pregnancy scanning ($n=190$) were asked if they scanned in 2013 and, if so ($n=112$), what the scanning percentage was. The two scanning questions were only asked of any particular respondent if they had indicated earlier in the survey that they had mated ewes of that breed (i.e. Merino or meat and maternal). This resulted in 42 producers with Merino mating and 12 producers with meat and maternal mating providing details of their scanning percentage. Only the results from the producers with merino mating is included in this report as there are too few producers with meat and maternal mating that scan to provide any valuable information. Note that the average scanning rate of 120% fits the accepted industry average.

Table 24 Pregnancy scanning results for Merino ewes conceived in 2013 by zone

Zone	Scanned in 2013	#	Average scanning %	Average Merino marking %
MRZ	44	17	110	94
CSZ	68	25	127	97
WA	112	42	120	96

5.3 Condition scoring

Key findings within this chapter:

- Nine per cent of producers use objective measurement to assess the health of their ewes regularly.
- Visual assessment of ewes in the paddock is still the preferred method of monitoring ewes in WA regardless of enterprise type.
- The proportion of producers that only assess ewe nutritional status visually has reduced from 69% to 58%, mainly from wool and prime lamb producers (-19%) and wool producers (-12%).
- The proportion of producers that now occasionally use objective measurement to assess ewes has increased from 24% to 33%.
- Prime lamb (39%) and wool and prime lamb producers (36%) are more inclined to monitor ewe objectively occasionally (25%).

One question about managing ewes' nutritional status was asked in the 2014 survey.

Which one of the following statements best describes how you monitor ewe condition including condition scoring, fat scoring or weighing, do you usually:

make regular visual assessments in the paddock

visually estimate in the paddock and occasionally fat score, condition score or weigh a sample of the ewes when they are in the yards

condition score, fat score or weigh a sample of each ewe mob and manage to average mob targets for joining/lambing/weaning

condition score, fat score or weigh and draft all ewes, manage mobs according to condition to meet set targets for joining/lambing/weaning.

This question was also asked in the 2011 Western Australian producer survey, with the minor change in phrasing leading up to the options "Regarding methods of monitoring ewe condition including condition scoring, fat scoring or weighing, do you usually..." with all options being exactly the same.

Table 25 The usual practice of condition scoring for 2011 and 2014. (The figures marked with a superscript 'a', and 'b' are the only figures that are significantly different for year-to-year comparisons)

Method of monitoring	2011	2014
Visual in paddock	69% ^a	58% ^b
Visual and occasionally score	24% ^b	33% ^a
Regularly score	4%	6%
Score to manage to targets	4%	3%

The 2014 data shows that only 6% regularly monitor the condition of ewes and a further 3% monitor to meet targets. There has been some improvement among those who hadn't used any objective measurement to monitor the health of ewes. The proportion of producers that only visually assess their ewes health in the paddock has reduced from 69% to 58%, while the proportion of those that usually visually assess but do some hands-on monitoring occasionally has increased from 24% to 33%.

The 2014 survey found that there was just one significant difference between enterprises. A much smaller proportion of wool producers (25%) assess the health of their ewes visually with the occasional condition score, compared to prime lamb producers (39%) and wool and prime lamb producers (36%). This appears to be, mostly, a result of wool producers that used to only assess visually, now objectively monitoring. A comparison of the proportion of wool producers that conduct visual assessments only shows that there are now far less of them assessing ewes in this way (64% down from 76%). There has also been a significant decrease in the proportion of wool and prime lamb producers using visual assessment only (from 67% to 56%) and an increase in the

proportion of wool and prime lamb producers using objective measurement occasionally (from 25% to 36%).

Table 26 The usual practice of condition scoring by enterprise type (2014 data only; $p < 0.10$). (The figures marked with 'a' and 'b' are significantly different between enterprises; figures marked with 'i' and 'ii' are significantly different between years)

Practice	Wool 2011	Wool 2014	Prime lamb 2011	Prime lamb 2014	Wool and prime lamb 2011	Wool and prime lamb 2014
Visual in paddock	76% ⁱ	64% ⁱⁱ	60%	55%	67% ⁱ	56% ⁱⁱ
Visual and occasionally score	19%	25% ^b	30%	39% ^a	25% ⁱⁱ	36% ^{a,i}
Regularly score	4%	7%	8%	5%	4%	6%
Score to manage to targets	1%	3%	3%	2%	5%	2%

5.4 Lamb survival

Key findings within this chapter:

- Seventy one per cent had undertaken some activity to improve lambing percentage in the five years prior to 2014.
- Ninety six per cent (of that 71%) opted to ensure ewes nutritional demands were being met before and during pregnancy.
- Ninety four per cent of prime lamb producers (within that 71%) acted to protect their lambing ewes from predators; 14% higher than wool and prime lamb producers and 24% higher than wool producers.
- Fifty seven per cent of producers that had undertaken activities to improve lambing percentage had tried at least four different methods. 10% had tried all six methods listed.

Have you undertaken specific steps to improve your lambing percentage over the last five years?

All respondents were asked if they had undertaken any activities to improve their lambing percentage in the five years prior. Those that had were then provided with a list of activities and asked if they had undertaken any of them. These options were:

Which of the following activities have you undertaken to improve lambing percentage?

Separated single and twin bearing ewes.

Provided extra shelter for twin lambing ewes.

Protected lambing ewes from predators.

Ram selection to improve reproduction.

Ensured that the ewes higher energy demands are met before and during lambing.

Wet/dry at weaning and cull non-performing ewes.

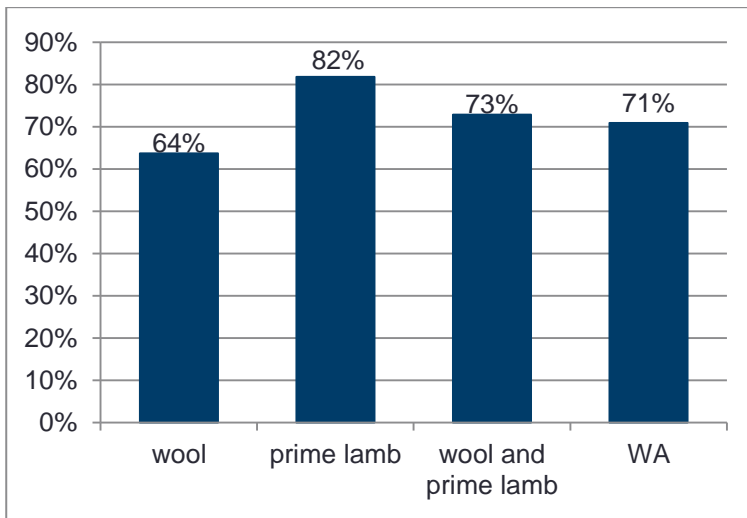


Figure 13 Proportion of producers that have undertaken steps to improve lambing per cent in the five years prior to 2014 by enterprise type

Seventy one per cent of respondents said that they had undertaken steps to improve lambing percentage in the five years prior to 2014. On an enterprise type basis, significantly more prime lamb producers (82%) than wool producers (+18%, $p < 0.05$) or wool and prime lamb producers (+9%, $p < 0.10$) have undertaken steps to improve their lambing percentage. Also, significantly more ($p < 0.10$) MRZ producers (76%) than CSZ producers (68%) had undertaken steps to improve lambing percentage.

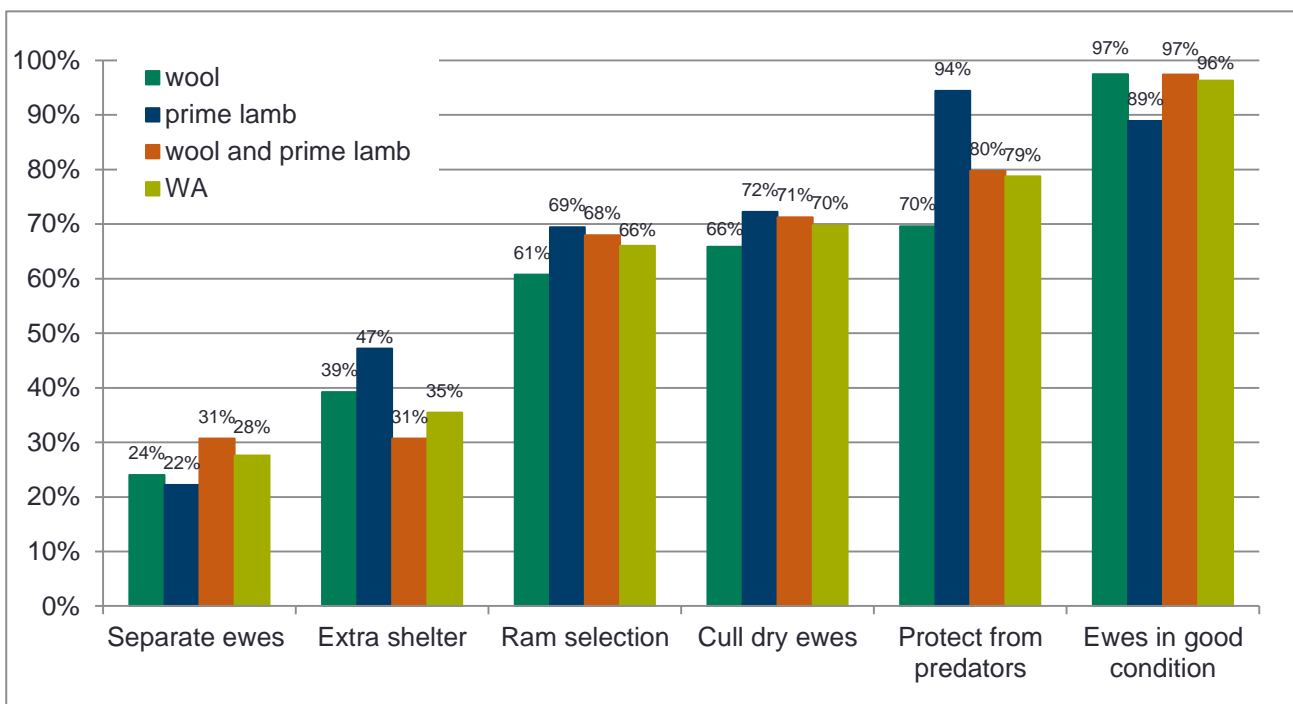


Figure 14 The proportion of those producers that have undertaken steps to improve lambing percentage that have undertaken the specific steps proposed in the survey ($n = 268$)

Figure 14 shows that maintaining ewes in good condition prior to and during pregnancy was the most common way that producers attempted to improve lambing percentage (96% of producers that undertook improvements did this). The lower figure for prime lamb producers may mean that they have been maintaining ewes in good condition for longer than five years.

The second most common way of increasing lambing percentage was by providing extra protection from predators for lambing ewes. Of those that had tried to improve lambing percentage, 79% undertook this activity. There were significant differences between each enterprise type on this activity. For prime lamb producers this activity was more common than maintaining pregnant ewes

in good condition. Ninety four per cent of the prime lamb producers that attempted to improve lambing percentage provided extra protection, compared to 80% of wool and prime lamb producers and 70% of wool producers.

The behaviours associated with breeding to improve reproduction (culling of non-performing ewes and ram selection) were the third most popular activities for improving lambing percentage with 70% and 66% of producers aiming to improve lambing percentage undertaking these activities respectively. There was no difference between enterprise types on these activities. Curnow (2010)¹ reported that 13% of Western Australian Merino producers would cull ewes if found dry once and 7% would cull ewes if found dry twice. There appears to have been considerable growth in this practice since the 2009 survey conducted for that report.

Thirty five per cent of the 71% of producers provided extra shelter for lambing ewes. While it looks like there was a great deal of variation between enterprise types on this activity, the low numbers within this subgroup mean that none of the differences are significant.

Separating single and twin bearing ewes was a method utilised by 28% of those that made some attempt at improving lambing percentage. Not all of these producers, however, had the information required to be able to do this as 5% of them had said that they don't scan (see Table 5.10). As this method of improving lambing percentage may have been employed anytime within the previous five years, it's possible that the producers had scanning information to support the decision at some point. Only 79% of producers that scan for multiples, however, actually separate single and twin bearing ewes. Of the 151 respondents that said that they scan, 92 said that they manage their single and twin bearing ewes individually. Of this 92, 62% also indicated in this question that they had separated twin and single bearing ewes to improve lambing percentage in the five years prior to 2014.

Table 27 Breakdown of those that separate single and twin bearing ewes by scan type (2014 data only)

Scan type	% of those that separate (n=74)	Those that separate as % of scan type (n=377)
Don't scan	5%	2%
Scan: bad years only	5%	11%
Scan: pregnant or not	32%	24%
Scan: litter size	57%	79%
All		20%

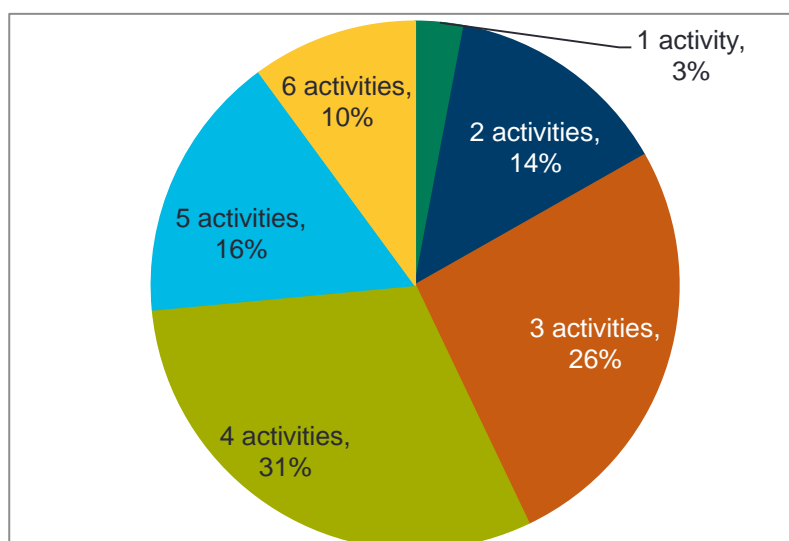


Figure 15 The number of activities the respondents that had attempted to improve lambing percentage had undertaken

¹ Curnow et al (2010) *Selection of Merino Ewes on Reproductive Performance by producers in southern Australia* in Proc. Aust. Soc. Anim. Prod. 2010. vol. 28 p 60

Figure 15 shows that 10% of the 268 respondents that said they had undertaken some activities to improve lambing percentage had done all six of the activities listed. Over 57% had tried at least four of the six activities to improve lambing percentage.

5.5 Weaner mortality

Key findings:

- Thirteen per cent of producers did not know or report what their 2013 weaner mortality percentage was (11% don't know or report their average weaner mortality rate).
- The proportion of producers reporting a zero mortality rate has reduced from 12% to a more believable rate of 7%.
- Eighty eight per cent of producers have a weaner mortality percentage of 5% or under.

In both the 2011 and 2014 surveys, producers were asked about their weaner mortality, with the only change in phrasing being “mortality rate” (in 2011) and “mortality percentage” (in 2014).

Within the 2013 lamb drop, what was the mortality percentage (rate) of your weaners between the age of weaning and 6 months of age?

And in general, what would be the average weaner mortality percentage (rate) between the age of weaning and 6 months of age for your property?

These questions were asked of all respondents. In 2014, 13% of respondents did not know what their weaner mortality percentage was in 2013 and 11% did not know what their average weaner mortality percentage was. Of those that provided data on their 2013 mortality percentage ($n = 330$) 88% reported a weaner mortality percentage of 5% or under, 7% of which reported a zero mortality percentage. The 88% is not significantly different from the 2011 report figure of 90%, but the 7% zero mortality is significantly different from the 12% zero mortality reported in 2011. There were no significant differences between zones.

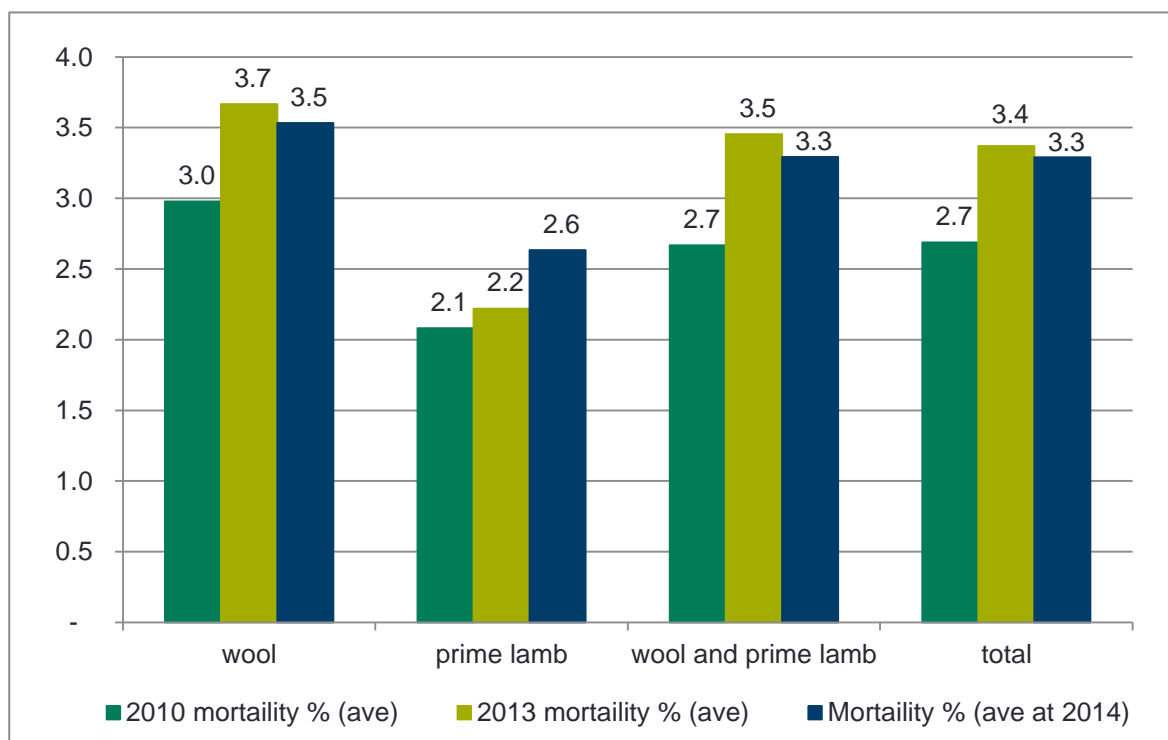


Figure 16 Weaner mortality by enterprise types for 2010, 2013 and average as at 2014

Figure 16 shows that, in 2013, the mortality percentage for prime lamb enterprises (2.2%) was significantly different to the wool (3.7%) and wool and prime lamb enterprises (3.5%). The average mortality percentage stated by prime lamb producers (2.6%) is also significantly lower than that stated by wool (3.5%) or wool and prime lamb (3.3%) producers ($p < 0.10$). The average reported weaner mortality for the state was 3.3%.

It is problematic to use lamb mortality percentage as an indication of producers' behaviours regarding lamb survival practices. Figure 16 shows a considerable increase in mortality rates since the 2010 season. However, if we look at the longer view and include data reported by Curtis (2008) it appears that Western Australian producers have made considerable advances in lamb survival (see Table 28). It is expected that the variation between years and states is largely influenced by seasonal conditions.

Table 28 The proportion of producers with weaner mortality of greater than 6% by state. 2008 source: DAFWA Wool desk report (K Curtis)

% of producers with >6% mortality	2008	2010	2013
New South Wales (NSW)	17%	26%	15%
Victoria (VIC)	19%	26%	14%
South Australia (SA)	10%	18%	9%
WA	28%	6%	13%
National average	19%	20%	13%
<i>n</i> =	1380	912	890

5.6 Marking and mulesing practices

Key findings:

- Twelve per cent of producers with merino lambs don't mules.
- Fifty nine per cent of merino lambs being mulesed are being mulesed with pain relief.
- MRZ producers are slightly more inclined to not mules (13% compared to 12%) and slightly more inclined to mules with pain relief when they do (53% compared to 51%).
- Prime lamb producers are less likely to mules their Merino lambs (27% aren't mulesed), but when they do they are also far less likely to mules with pain relief (56% mulesed without relief).
- Wool producers are far more likely to mules (92% of Merino lambs), but are also more likely to do so with pain relief (68% of mulesed Merino lambs are mulesed with pain relief).

In the last two surveys producers were asked to disclose their mulesing practices. In the 2014 survey the following question about mulesing practice was only asked of respondents that said that they had mated Merino ewes to merino sires in 2013. Previously this question had also been asked in relation to meat and maternal sire mating, however the 2010 figures quoted in Table 5.12 below are related to 2010 Merino mating only for more accurate comparison.

How many Merino ewes were mated to Merino rams, to lamb in 2013 (including Dohnes and SAMMs)?

How many lambs were marked from these Merino ewes?

And of those Merino lambs, what percentages were:

mulesed with pain relief

mulesed without pain relief

not mulesed.

There were 305 Western Australian producers with a Merino mating in 2013. Only five of these producers did not answer the question on mulesing.

While the proportion of Merino lambs not mulesed remains at 12%, the proportion of Merino lambs that are currently mulesed with pain relief has increased by 4% to 52%. This is equivalent to 59% of those Merino lambs being mulesed are being mulesed with pain relief. There is no significant difference between zones.

Table 29 The proportion of lambs either not mulesed or mulesed with or without pain relief by zone and year

Year	% lambs mulesed with pain relief	% lambs mulesed without pain relief	% lambs not mulesed	Total lambs represented
WA (2013)	52%	36%	12%	490 290
WA (2010)	48%	40%	12%	505 461

There are more striking differences when looking at enterprise types. Prime lamb producers are more likely to not mules their Merino lambs (at 27% compared to 15% or 12%), but when they do they are much more likely to mules without pain relief (at 56% compared to 40% or 30%). Producers that consider themselves to be Merino specialist producers are far more likely (62% compared to 45% or 17%) to mules with pain relief. This equates to 68% of wool producers mulesed Merino lambs being mulesed with pain relief.

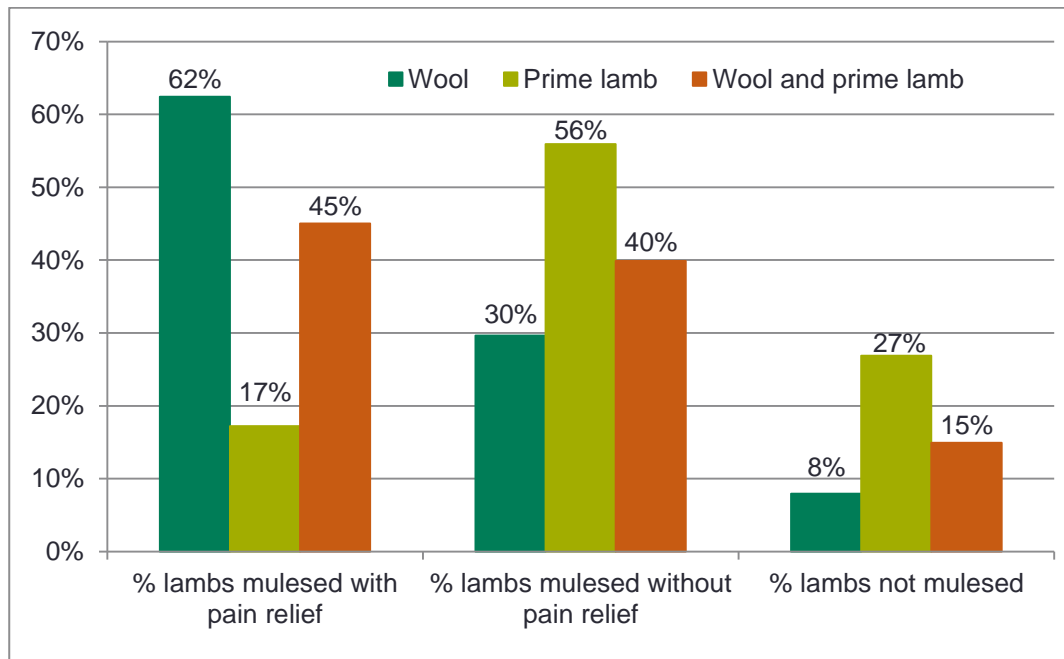


Figure 17 The proportion of lambs either not mulesed or mulesed with or without pain relief by enterprise type

6. Improved parasite control

6.1 Worm control practices

Key findings:

- Twenty four per cent of Western Australian producers conduct WECs, whereas nationally 42% of producers WEC.
- More MRZ producers conduct WECs (37% compared to 17% of CSZ producers).
- Of those Western Australian producers that do WECs, 94% conducted WECs on their weaners and 72% on their hoggets in 2013.
- Of those Western Australian producers that do WECs, 49% conducted one test on their weaners and 41% conducted one test on their hoggets in 2013.
- Nationally, 17% more producers (than WA) tested their weaners (62% compared to 45%) and their hoggets (46% compared to 29%) two or more times.
- WEC practices are linked to flock size.
- Eighty seven per cent of Western Australian producers have a worm control program that includes rotating drenches (less than at a national level: 91%).
- Fifty per cent of Western Australian producers have a worm control program that includes grazing management (less than at a national level: 59%).
- Eighteen per cent more Western Australian producers (net) believe that drench resistance is more important than it was five years prior (compared to 30% of producers nationally).
- Seven per cent of Western Australian producers with 11% of the represented flock use fully (100%) effective drenches.

Worm egg counts

Weaners and hoggets are the two classes of sheep most at risk of worm burdens to a level which affect health and wellbeing. Faecal worm egg counts, commonly known as WECs, are a method used to determine overall worm burden in sheep. It is a recommended practice in all states and has greater or lesser importance in weaners, immature sheep and adults in different zones. The questions included in the 2014 survey were:

Did you do any faecal worm egg counts on any of your sheep in 2013?

How many times did you conduct faecal worm egg counts on weaners in 2013?

How many times did you conduct faecal worm egg counts on hoggets in 2013?

In 2011 respondents were asked “In what month or months in 2010 did you test weaners/hoggets?”. For the purposes of comparison with 2014 data the responses to those questions are presented in the simpler format reflecting how many times they conducted counts. There may be an effect on the outcome of the response based on how the question was asked.

Table 30 The proportion of producers that conduct faecal worm egg counts by zone. Note only MRZ and CSZ data shown on this table. All the zones combined are included in the total value of 42%. (The figures marked with a superscript ‘a’ and ‘b’ between columns are significantly different.)

Yes %	WA	National*
MRZ	37% ^b	40% ^a
CSZ	17% ^b	24% ^a
All zones	24%	42%

Twenty four per cent of Western Australian producers conduct WECs. This is significantly lower than the national figure of 42%. There was no significant difference in the proportion of producers doing WEC between enterprises. The MRZ producers did significantly more testing than the CSZ which was expected in that the MRZ would have a higher prevalence of worms and greater impact

on productivity than the CSZ. This is the case in WA and nationally. There has been no significant change since 2011 on all of these accounts.

Table 31 WEC tests per year by class of sheep conducted by producers that do worm egg counts. (All 2011 and 2014 comparisons are significantly different. Only the figures marked with a superscript 'a' and 'b' in the WA/National comparisons are significantly different.)

Tests per year	Weaners 2011 (WA)	Weaners 2014 (WA)	Weaners 2014 (National)	Hoggets 2011 (WA)	Hoggets 2014 (WA)	Hoggets 2014 (National)
None	16%	6%	6%	31%	29%	26%
Once	60%	49% ^a	33% ^b	49%	41% ^a	29% ^b
Twice	17%	29%	25%	13%	21%	20%
>2 times	8%	16% ^b	37% ^a	6%	8% ^b	26% ^a

There has been a considerable change in practice between the 2010 and 2013 seasons where more producers are testing more often. Nearly all (94%) producers that conducted WECs in 2013 conducted them on their weaners at least once. This is in contrast with the 2011 data that said 84% of producers that do WECs conducted a test on their weaners in 2011. Seventy two per cent of Western Australian producers that do worm egg counts conducted at least one count on their hoggets in 2013. Western Australian producers are more likely to conduct a WEC once but less likely to conduct a test more than twice compared to the national rate. Nationally, 17% more producers tested weaners (62% compared to 45%) and hoggets (46% compared to 29%) two or more times.

The 2011 survey identified that producers with larger flocks were more likely to conduct WECs. A similar response was found in 2014 (no significant difference at $p < 0.10$).

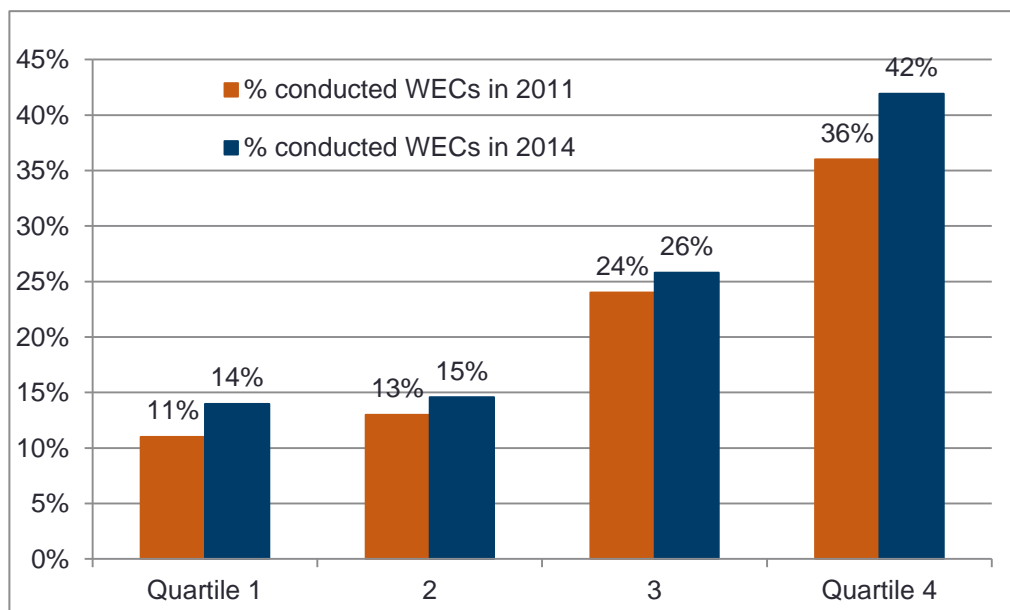


Figure 18 The proportion of producers conducting WECs, by flock size quartile (2011 and 2014 data)

Worm control program

Do you have a worm control program that includes:

A grazing management plan for worm control?

Rotating between drench types to reduce the risk of resistance?

Leaving some animals un-drenched within a mob to manage resistance?

Respondents were given the opportunity to say 'yes' or 'no' to each of the above questions. For all of the questions that respondents answered yes to, they were then asked if they started doing that within the previous five years.

Table 32 Proportion of respondents that have undertaken worm control activities. Note: *denotes that percentages provided as a proportion of those that say that do that activity. (The figures marked with a superscript 'a' and 'b' (between columns) are significantly different at $p>0.10$)

Worm control activity	WA producers answered 'Yes'	WA producers in last 5 years*	National producers answered 'Yes'	National producers in last 5 years*
Grazing management plan	50%	58%	59%	58%
Drench rotation	87%	42%	91%	41%
Leaving some un-drenched	18%	63%	14%	66%

About a third of Western Australian producers have adopted worm control activities such as employing a grazing management plan and rotating drench types within the five years prior to 2014. A larger proportion of producers nationally undertake these activities. The relatively recent message about leaving some animals un-drenched has not been so readily adopted. Uptake of these activities is the same in WA over the five years prior to 2014 as it was across the country.

Drench resistance and effectiveness

All respondents were asked:

Is drench resistance more (1), less (2) or just as important (3) in your decision making compared to five years ago?

Yes - more important than five years ago.

No - less important than five years ago.

Just as important.

Table 33 Change in attitude of WA producers regarding drench resistance

Zone	Yes – more important than 5 years ago	Just as important	No – less important than 5 years ago
MRZ	30%	64%	6%
CSZ	26%	62%	12%
WA	28%	63%	10%

There has been a net increase of 18% of Western Australian producers that believe that drench resistance is more important than it was five years prior. Nationally, there was a net increase of 30% of producers believing that drench resistance is more important.

What drench products did you buy in the last 12 months?

Producers were asked what drench products they had purchased in the last year in order to determine the usage of effective drenches. Drenches were rated as either:

1. Fully (100%) effective, no resistance by worms known in Australia.
2. Highly effective (>95%) in all cases, fully effective in great majority.
3. Highly effective on most farms, but resistance to some degree present.
4. Highly effective on many farms, but resistance to some degree present.
5. Highly effective on some farms, but variable and can't predict effectiveness.
6. Effective on a few farms as resistance affects almost all.

For a full description of the drenches listed, their rating for effectiveness and the number of producers using each type see Appendix 4. Table 34 summarises the results.

Table 34 Drench purchases with comparisons between producers who did or didn't conduct a WEC and against the national results

Metric	% of producers who purchased drenches with rating 1	% rating 2	% rating 3	% rating 4	% rating 5	% rating 6
Did a WEC	13%	33%	43%	30%	21%	0%
Didn't do a WEC	5%	13%	35%	26%	24%	6%
WA	7%	18%	37%	27%	23%	4%
National (Winter rainfall only)	6%	25%	35%	25%	29%	12%

Seven per cent of Western Australian producers use fully effective (rating 1) drenches. This is consistent with the proportion of producers nationally that purchase fully effective drenches. Western Australian producers have, however, purchased significantly less of the products that fall into rating 5 and 6 (the least effective drenches) than their counterparts in other states. Those producers that had conducted a WEC were more than twice as likely to purchase a product from rating 1 or 2.

Table 35 shows that a larger proportion of sheep are subject to rating 1 and 2, which implies that producers with larger flocks are more likely to use fully or highly effective (>95%) drenches.

Table 35 Proportion of sheep subject to drench purchases

Zone	% of sheep held by producers purchasing drenches with rating 1	% rating 2	% rating 3	% rating 4	% rating 5	% rating 6
WA data only	11%	27%	44%	28%	23%	4%

6.2 Lice control practices

Key findings within this chapter:

- Sixty three per cent of Western Australian producers treat for lice every year and 32% treat only when seen.
- Twenty two per cent more CSZ producers are more likely to treat routinely every year, 19% more MRZ producers treat when lice are seen.
- Prime lamb producers more likely not to treat at all (+18%).
- Producers that treat their sheep for lice every year (93%) do so “just in case” there is contact with untreated sheep or they had been missed in other treatments.

All respondents to the 2014 survey were asked:

Do you treat your sheep for lice:

Routinely every year?

Only when lice are seen?

Not at all?

Sixty three per cent of producers treat for lice routinely every year. As the lice control products on the market now are short acting, routinely treating sheep for lice without an inspection is an ineffective and costly approach. In total, 95% of Western Australian producers treat lice at some stage.

Table 36 Proportion of respondents that have undertaken lice control treatments. (The figures marked with a superscript 'a' and 'b' (between years) and figures marked with 'i' and 'ii' (between zones) are significantly different at p<0.10)

Treatment	WA 2011	WA 2014	MRZ 2014	CSZ 2014	Wool 2014	Prime lamb 2014	Wool & prime lamb 2014
Routinely every year	67%	63%	49% ⁱⁱ	71% ⁱ	66%	43%	66%
Only when lice are seen	25% ^b	32% ^a	44% ⁱ	25% ⁱⁱ	29%	34%	33%
Not at all	8%	5%	7%	4%	5%	23%	1%

There was an increase of 7% (to 32%) in the proportion of producers that only treat lice when seen between 2011 and 2014. This has come mostly from producers in the MRZ that previously had not treated at all (down 5% from 12%) and in the CSZ from producers that would have previously routinely treated every year (down 7% from 78%).

A comparison between zones shows that CSZ producers are still much more likely (+22%) than MRZ producers to treat sheep for lice routinely every year. Conversely, MRZ producers are still much more likely (+19%) to treat sheep for lice only when lice are seen.

A comparison between enterprise types shows that prime lamb producers were still the most likely to not treat at all. Both the wool and wool and prime lamb respondents were similar in their behaviour.

Those respondents that replied that they treat their sheep every year were also asked:

Do you treat your sheep every year because:

You see lice on your sheep every year?

You see signs of lice (eg sheep rubbing) every year?

You do so as a precaution in case there are low levels present?

To cover the chance of contact with untreated sheep (e.g. neighbours or imported sheep)?

Respondents were given the opportunity to select as many of the above options as relevant. The results are shown on Table 37 and show that the predominant reason for producers treating their sheep for lice each year is "just in case" (there is contact with untreated sheep or they had been missed in other treatments).

Table 37 Proportion of producers that responded 'yes' to the options on why they treat for lice every year

Option	WA	MRZ	CSZ
You see lice on your sheep every year	27%	33%	24%
You see signs of lice (e.g. sheep rubbing) every year	37%	37%	36%
You do so as a precaution in case there are low levels present	92%	87%	94%
To cover the chance of contact with untreated sheep (e.g. neighbours or imported sheep)	93%	93%	93%

WA sheep producers were also asked:

What lice control products did you use in the last 12 months?

Figure 19 shows the responses to this question.

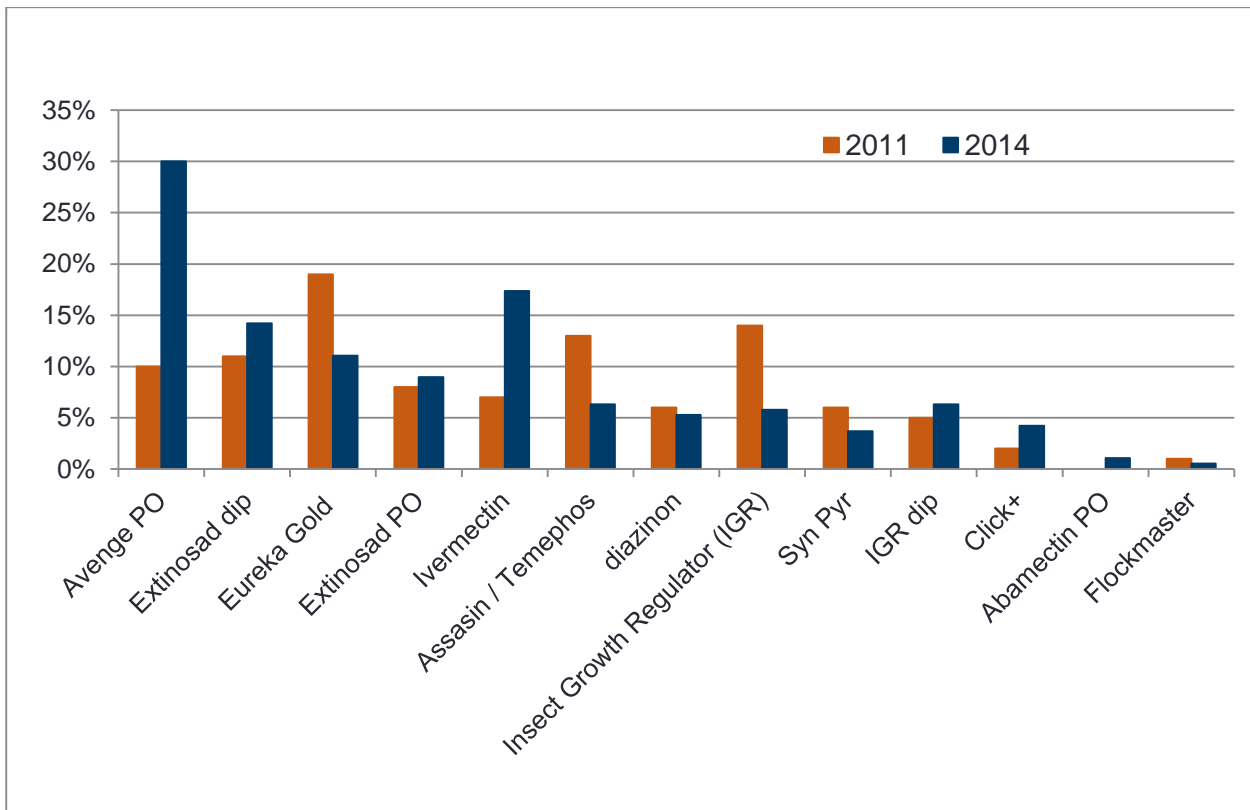


Figure 19 Proportion of producers who used each lice treatment product (n=190)

6.3 Flystrike control practices

Key findings within this chapter:

- Six per cent more producers treat sheep to prevent flystrike only when the risk is high (now 26%).
- Six per cent fewer producers only treat individually struck sheep (now 33%).
- Eighty eight of respondents are attempting to improve their genetics for flystrike resistance.

All respondents were asked:

With regards to flystrike, do you:

Treat your sheep routinely with preventive chemicals for flystrike every year?

Treat your sheep with preventive chemicals only when the risk of flystrike is high?

Treat the whole mob of sheep once flystrike is detected?

Only treat individually struck sheep?

Producers were asked the same question in 2011. Figure 20 shows how responses have changed over time. The option of treating only individually struck sheep has declined from 39% to 33% ($p < 0.10$) and the proportion of respondents that treat with preventative chemicals only when risk is high, had increased significantly from 20% to 26% ($p < 0.05$). These results indicate a more strategic approach to flystrike management.

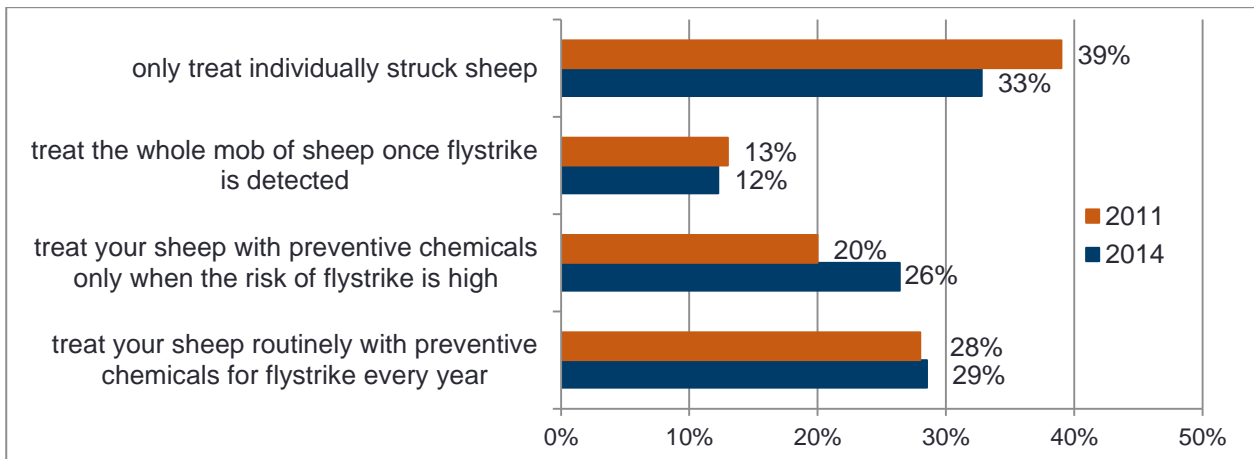


Figure 20 Flystrike treatment approach (2011 and 2014 data)

For the first time, in 2014, further questions were asked about a range of other fly control behaviours. If respondents answered yes to any of the above questions, then they were asked if they had started within the previous five years.

The following questions are about how you manage flies in your flock.

Do you cull sheep based on breech or body wrinkle scores?

Do you cull individual sheep from your flock if they have been fly struck?

Do you consider the wrinkle score of merino ram when purchasing or breeding replacement rams?

Table 38 Proportion of respondents that have undertaken fly control activities. Note: * represents a proportion of those that say that do that activity

Fly control activity	Yes %	Included in last 5 years*
Cull sheep based on breech or body wrinkle scores	59%	54%
Cull individual sheep if they have been fly struck	60%	50%
Consider the wrinkle score of Merino ram when purchasing or breeding replacement rams	76%	56%

More than half of the producers had implemented breeding strategies to minimise the incidence of breach and body strike in their flocks, and more than half of those had adopted these practices in the five years prior to 2014.

The level of importance shown for considering wrinkle score when selecting rams is mirrored in the results seen in Chapter 4.3 on importance of ASBV on breech wrinkle where 52% of producers that buy rams consider this trait more important than five years earlier.

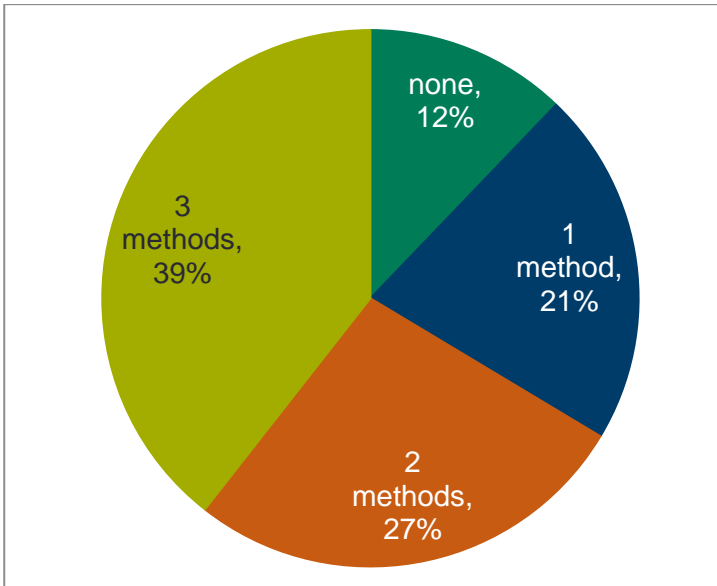


Figure 21 Proportion of producers conducting flystrike management options such as those listed in table 38

Figure 21 shows that 12% of producers had not undertaken any of the breeding measures to control flystrike. However, 66% had employed two or three of these measures.

7. Implications of the data

A look at the demographics and production data shows that, while the number of sheep producers hasn't declined, the flock sizes are getting smaller. Having said that, efficiencies appear to be improving as the reduction in the number of lambs being turned off is not commensurate with the decline in the number of ewes being mated. Marking rates for Merino and meat and maternal flocks have improved. The cereal sheep zone has witnessed some change of focus away from wool and prime lamb and back to pure Merino wool.

In terms of the Western Australian sheep producers' capacity to improve the genetics of their flock, it appears that this environment is evolving. While there are slight improvements by commercial producers in thinking more about objective measurement for genetic improvement, their practices are limiting their capacity to grow. More ram sellers are providing genetic information on all of their rams, particularly the larger sellers. However commercial producers appear to be buying less in favour of breeding their own rams rather than buying rams. Western Australian ram breeders are currently earning less as a result of the downturn in demand potentially resulting in a reduced capacity for ram breeders to invest in new technology and training.

Western Australian sheep producers lag behind in some of the key behaviours that are well proven to improve productivity through ewe management. Less Western Australian producers scan and separate twin and single bearing ewes than producers nationally. Scanning has been shown (in research and in comparing the production capabilities of the respondents to this survey) to improve marking rate. The messages about the value of separating single and twin bearing ewes have only become apparent more recently. The improvements in the other states in this regard have been shown to be strongly linked to producers' participation in the Lifetime Ewe training program. This data shows there is still a need in Western Australia for this training and validates the investment by Western Australian government and industry in this area.

Western Australian sheep producers are particularly behind the rest of the nation in terms of parasite management. While there has been improvement in the use of WEC to monitor worm burdens the frequency of conducting these tests is much lower than in other states. Fewer Western Australian producers have adopted management strategies to reduce parasite burdens and continue to implement costly and ineffective treatments.

In conclusion, there have been some positive achievements made by Western Australian sheep producers in recent years. The opportunity for Western Australia now is to take advantage of the training methodologies that have facilitated positive change in the rest of the country and maintain the momentum currently being witnessed.

Appendix 1 Conduct of the telephone survey

Ipsos Australia conducted the field work for this survey. The survey was conducted via telephone. Based on the questionnaire provided, the interview took around 25 minutes.

Participants were selected randomly from the list of (sheep) producers owned by Ipsos' fieldwork partner I-view. Each number was called up to five times at different times of the day, focusing initially on calling them at lunch time and after 5pm. DAFWA specified that I-view limit their contact to a small proportion of their database and conduct multiple call backs to maximise response rates and minimise non response bias. Where the selected producer does not participate in the survey the reason for non-participation was recorded (e.g. could not be contacted).

A pilot survey was conducted with 30 participants prior to going out to the full list. The results of this test resulted in modifications to the questionnaire.

The same methodology was used for the 2011 survey but was run by a different market research company, Kaliber Research Group, using their database of producers. Both Ipsos Australia and Kaliber were engaged because of their extensive database of sheep producers, their familiarity of the agricultural sector and their capacity to conduct the fieldwork within the timeframe of the projects.

Appendix 2 Accessibility of producers

The number of responses for this survey nationally was 1200 producers. One thousand of these constituted a representative sample of the national population of sheep producers; while a further 200 respondents were collected solely from Western Australia (making the total collected from Western Australia higher than if national proportional sampling was used to select all 1200 respondents).

Table 39 below show how many producers were approached to achieve the 368 Western Australian respondents in 2014 and the 380 Western Australian respondents in 2011. The response rate for the 2014 survey is 8%.

Table 39 Status of contact with producers in WA at the end of data collection

Status	2011 count	2011 %	2014 count	2014 %
Completed	380	9	378	8
Refused	776	19	555	12
<500 sheep	647	16	838	19
No response after five attempts	1539	38	171	4
Live number			1969	44
Invalid phone number	715	18	553	12
Other			22	1
Total numbers drawn	4057		4486	

Appendix 3 2014 survey questionnaire

Q state	State
New South Wales (NSW)	2
Victoria (VIC)	3
Queensland (QLD)	4
South Australia (SA)	5
Western Australia (WA)	6
Tasmania (TAS)	7

Qp zone	Production zone
Medium Winter Rain	1
High Winter Rain	2
Cereal-Sheep	3
High Summer Rain	4
Medium Summer Rain	5

Q1. Do you currently have 500 or more sheep on your property?

Yes 1 No 2

Q2. What was the total number of sheep on the property at 30 June 2013, including lambs?

Q3. What is the total area, in hectares, that is grazed by sheep as pasture, standing green crops and stubbles, including all leased land?

Q4. What is the primary purpose of your sheep enterprise? Is it...

Wool production 1
 Prime lamb production 2
 Wool production and prime lamb production 3

Q5a. How many Merino ewes were mated to Merino rams, to lamb in 2013 (including Dohnes and SAMMs)?

Q5b. How many lambs were marked from these Merino ewes?

Q5c. What was the marking percentage for your Merino lamb drop in 2013?

Q5d. And of those Merino lambs, what percentages were:

mulesed with pain relief?
 mulesed without pain relief?
 not mulesed?

Q6a. How many Merino ewes were mated to meat or maternal rams to lamb in 2013?

Q6b. How many cross-bred lambs were marked from these ewes?

Q6c. What was the marking percentage for your first cross lamb drop in 2013?

Q7a. How many meat or maternal ewes were mated to meat or maternal rams to lamb in 2013?

Q7b. How many lambs were marked from these meat or maternal ewes?

Q7c. What was the marking percentage for your meat or maternal lamb drop in 2013?

Q9. Can you please state whether you have (1) not heard of, (2) heard of but not attended or (3) attended any of these events or training programs?

Not heard of

Heard of but not attended

Attended

Q9a. Sheep CRC Conference or CRC Regional Updates 1 2 3

[if attended] Q10a. Have you changed any of your management practices as a result of attending that event?

Q9b. Managing Flystrike workshop 1 2 3

[if attended] Q10b. Have you changed any of your management practices as a result of attending that event?

Q9c. Managing Pregnant Ewes (or Pregnancy Scanning) workshop 1 2 3

[if attended] Q10c. Have you changed any of your management practices as a result of attending that event?

Q9d. Worm control workshop 1 2 3

[if attended] Q10d. Have you changed any of your management practices as a result of attending that event?

Q9e. Lifetime Ewe Management course 1 2 3

[if attended] Q10e. Have you changed any of your management practices as a result of attending that course?

Q9f. High Performance Weaner course 1 2 3

[if attended] Q10f. Have you changed any of your management practices as a result of attending that course?

Q9g. Precision Sheep Management workshop 1 2 3

[if attended] Q10g. Have you changed any of your management practices as a result of attending that event?

Q9h. RamSelect workshop 1 2 3

[if attended] Q10h. Have you changed any of your management practices as a result of attending that event?

Q9i. Bred Well Fed Well workshop 1 2 3

[if attended] Q10i. Have you changed any of your management practices as a result of attending that event?

Q11. Please tell me do you:

- | | |
|---|---|
| Run a commercial flock and buy rams | 1 |
| Breed rams for your own commercial flock | 2 |
| Breed rams for sale | 3 |
| [Do not read out] Do not breed/purchase rams or semen | 4 |

Q12. When selecting your replacement rams, do you consider the following traits to be more, less, or just as important than you did five years ago?

- Lamb weaning percentage or ASBV for number lambs weaned
- Parasites resistance or ASBV for Worm Egg Count
- Plain body or ASBV for early breach wrinkle score
- Dags or ASBV for dag score
- Muscling or ASBV for eye muscle depth
- Fatness or ASBV for fatness

Q13a. Which one of the following statements best describes how you usually select your stud or ram source for your primary sheep enterprise?

- I have never considered going to anyone other than my regular stud breeder
- I choose a stud breeder based on advice from my classer, agent or consultant
- I usually go to the ram sales or shows and select a stud that suits my needs
- I review wether trial data, sire evaluation data, sale reports etc and select a stud breeder that is performing well
- I use ASBVs or information from Sheep Genetics and/or selection indexes to select a breeder that matches my breeding objective

Q13b. Which one of the following statements describes the main reason for never considering anyone other than your regular stud breeder?

- | | |
|---|---|
| My stud breeder is conveniently located to my property | 1 |
| I have a good relationship with my stud breeder | 2 |
| I am confident that my stud breeder sells rams that perform well | 3 |
| I determined years ago to purchase from my regular breeder based on performance data and have never had cause to change this decision | 4 |

Q13c. Which one of the following statements best describes how you select rams to buy?

- | | |
|---|---|
| My classer or agent chooses the rams | 1 |
| I choose the rams based on how they look | 2 |
| I choose rams mainly on how they look but use some performance data such as fibre diameter, live weight or eye muscle depth | 3 |
| I choose rams with a balance of visual appeal, performance data and some genetic information such as ASBVs or breeding values | 4 |
| I choose rams based on genetic information such as ASBVs, breeding values or selection indexes | 5 |

Q14. Which one of the following statements best describes your current level of knowledge of Australian Sheep Breeding Values (ASBVs)?

- | | |
|---|---|
| I have never heard of ASBVs | 1 |
| I have heard of ASBVs but don't understand them | 2 |
| I have a basic understanding of ASBVs | 3 |
| I have a good understanding of ASBVs | 4 |
| I have a detailed knowledge of ASBVs | 5 |

Q15. How many rams did you sell in 2013?

Q16. What percentage of the rams that you sold (or sold semen from) in 2013 had Australian Sheep Breeding Values (ASBVs)

Q17a. Have you heard of the following electronic systems?

	Yes	No
Automatic drafting equipment	1	2
Electronic ear tags	1	2
Paddock based 'Walk over weighing' system	1	2
Pedigree Matchmaker	1	2

Q17b. Are you (1) considering, (2) not considering or (3) already using these systems?

	Considering	Not considering	Using
Automatic drafting equipment	1	2	3
Electronic ear tags	1	2	3
Paddock based Walk over weighing system	1	2	3
Pedigree matchmaker	1	2	3

Q18a Which one of the following statements best describes how you use pregnancy scanning to manage the nutrition of ewe flocks, do you:

Choose not to use pregnancy scanning	1
Only scan in bad years on some sheep	2
Scan ewes only for pregnancy status (pregnant or not)	3
Scan ewes to detect litter size	4

Q18b. Which one of the following statements best describes what you do with the pregnancy scanning information.

I don't change my nutritional management	1
I manage ewes according to their energy requirements as a single group	2
I manage dry, single and twin bearing ewes separately and according to their different energy requirements	3

Q18c Which one of the following statements best describes how you monitor ewe condition including condition scoring, fat scoring or weighing, do you usually:

Make regular visual assessments in the paddock	1
Visually estimate in the paddock and occasionally fat score, condition score or weigh a sample of the ewes when they are in the yards	2
Normally condition score, fat score or weigh a sample of each ewe mob and manage to average mob targets for joining/lambing/weaning	3
Condition score, fat score or weigh and draft all ewes, manage mobs according to condition to meet set targets for joining/lambing/weaning	4

Q19a Have you undertaken specific steps to improve your lambing percentage over the last five years?

- Yes
- No

Q19b Which of the following activities have you undertaken to improve lambing percentage?

	Yes	No
Separated single and twin bearing ewes	1	2
Provided extra shelter for twin lambing ewes	1	2
Protected lambing ewes from predators	1	2
Ram selection to improve reproduction	1	2
Ensured that the ewes higher energy demands are met before and during lambing	1	2
Wet/dry at weaning and cull non performing ewes	1	2

Q20 Did you pregnancy scan any ewes that lambed in 2013?

Yes	1	No	2
-----	---	----	---

Q21. What was the scanning percent (number of fetuses scanned per 100 ewes joined) for adult Merino ewes scanned in 2013?

Q22. What was the scanning percentage (number of fetuses scanned per 100 ewes joined) for adult Meat or maternal ewes scanned in 2013?

Q23a. Within the 2013 lamb drop, what was the mortality percentage of your weaners between the age of weaning and 6 months of age?

Q23b. And in general, what would be the average weaner mortality percentage between the age of weaning and 6 months of age for your property?

Q24. Did you do any faecal worm egg counts on any of your sheep in 2013?

Yes	1	No	2
-----	---	----	---

Q25a. How many times did you conduct faecal worm egg counts on weaners in 2013?

Q25b. How many times did you conduct faecal worm egg counts on hoggets in 2013?

Q26. The following questions are about how you manage worms in your flock. Do you have a worm control program that includes:

	Yes	No
Q26a a grazing management plan for worm control?	1	2

Q27a **Did you** implement that grazing management plan sometime within the last 5 years?

Q26c Rotating between drench types to reduce the risk of resistance?	1	2
--	---	---

Q27c **Did you** start a program of rotating drench types sometime within the last 5 years?

Q26d Leaving some animals un-drenched within a mob to manage resistance	1	2
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Q27d **Did you** start leaving some animals un-drenched within a mob to manage resistance within the last 5 years

Q27 Is drench resistance more (1), less (2) or just as important (3) in your decision making compared to 5 years ago?

Yes - more important than 5 years ago	1
No - less important than 5 years ago	2
Just as important	3

Q28. What drench products did you buy in the last 12 months?

None	Ivomec
Abamax	Ivomec Maximiser
Abamectin	Ivermectin
Absolute	Levamisole
Alben	Maverick
Albendazole	Maximus LA
Avomec Duel	Moxidectin
Bionic	Moximax
Closal	Moxitak
Closamax	Nilverm
Closantel	Noromectin
Closicare	Nucombo
Colleague	Panacur
Combat	Paramax
Combi	Paramectin
Combimax	Pyrimide
Combination	Q-Drench
Combo	Rametin Combo
Cydectin	Rametin
Cydectin LA	Ripercol
Cydectin plus Fluke	Rycomectin
Duocare	Scanda
Dynamax	Seponver
Eweguard	Sheepguard
Extender	Sustain
Fasimec	Switch
Fasinex	Tremacide
Fenbendazole	Triguard
First Drench	Triton
Firstmectin	Valbazen
Flukamec	Virbamec
Flukare	Weanerguard
Fluazole	Zolvix
Genesis	Zoomec
Hat-Trick	Other (specify)

Q29a. Have you heard of the WormBoss website?

Yes	1
No	2

Q29b. Did you use the WormBoss website in 2013?

Yes	1
No	2

Q29c. Did any information that you obtained from the WormBoss website influence your decision making?

Yes	1
No	2

Q30. Do you treat your sheep for lice:

- Routinely every year?
- Only when lice are seen?
- Not at all?

Q31. Do you treat your sheep every year because:

	Yes	No
You see lice on your sheep every year	1	2
You see signs of lice (eg sheep rubbing) every year	1	2
You do so as a precaution in case there are low levels present	1	2
To cover the chance of contact with untreated sheep (eg neighbors or imported sheep)	1	2

Q32. What lice control products did you use in the last 12 months?

Assassin	IGR Pour-On
Avenge Pour-On	Jetamec
Cannon Pour-On	Magnum Pour-On
Clik Plus Spray-On Blowfly+Lice or Clik Plus	Maverick
Clout 'S'	Piranha
Coopers Blowfly and Lice	Spurt
Di-Jet	Strike
Diazinon	Triffick
Diazinon (cage dipped only)	Vanquish
Eureka Gold	Wham
Extinosad	WSD Command Pour-On
Extinosad Pour-On	Zapp
Fleececare	Zinjet
Flockmaster	Other (specify)

Q33a. Have you heard of the LiceBoss website?

Yes	1	No	2
-----	---	----	---

Q33b. Did you use the LiceBoss website in 2013?

Yes	1	No	2
-----	---	----	---

Q33c. Did any information that you obtained from the LiceBoss website influence your decision making?

Yes	1	No	2
-----	---	----	---

Q34. The following questions are about how you manage flies in your flock.

	Yes	No
Q34b Do you cull sheep based on breech or body wrinkle scores?	1	2
Q35b Have you started culling based on this factor sometime over the last five years?	1	2
Q34c Do you cull individual sheep from your flock if they have been fly struck?	1	2
Q35c Have you started culling based on this factor sometime over the last five years?	1	2
Q34d Do you consider the wrinkle score of merino ram when purchasing or breeding replacement rams?	1	2
Q35d Have you started considering the wrinkle score of merino ram when purchasing or breeding replacement rams over the last five years?	1	2

Q35. With regards to flystrike, do you:

Treat your sheep routinely with preventive chemicals for flystrike every year	1
Treat your sheep with preventive chemicals only when the risk of flystrike is high	2
Treat the whole mob of sheep once flystrike is detected	3
Only treat individually struck sheep	4

Q36a. Have you heard of the FlyBoss website?

Yes	1	No	2
-----	---	----	---

Q36b. Did you use the FlyBoss website in 2013?

Yes	1	No	2
-----	---	----	---

Q36c. Did any information that you obtained from the FlyBoss website influence your decision making?

Yes	1	No	2
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Q37a. Are you familiar with the Sheep CRC's work in research and extension of sheep management?

Yes	1	No	2
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Q37b. On a scale of 1 to 5 where 1 is "Very poor" and 5 is "Excellent" how would you rate the Sheep CRCs performance in terms of:

A source of independent, credible information	1	2	3	4	5
The quality of their research	1	2	3	4	5
A recognised leader of innovation	1	2	3	4	5

Q38a. Have you (1) not heard of, (2) heard of and not used or (3) used any of these Sheep CRC products?

- 'Sheep – the simple guide to making more money with less work' book
- Ram buyers guide to ASBVs

Q38b. On a scale of 1 to 5 where 1 is "Not at all useful" and 5 is "Very useful" how would you rate these Sheep CRC products?

- 'Sheep – the simple guide to making more money with less work' book
- Ram buyers guide to ASBVs

Appendix 4 Classification of drench products

Product Name	Ranking	Product Type
Zolvix	1	AAD
Triguard	2	ML + BZ + LV
Q-Drench	2	ML + BZ + LV + SAL
Hat-Trick	2	ML + BZ + LV
Triton	2	ML + BZ + LV
Pyrimide	2	ML + BZ + LV
Rametin	5	OP
Rametin Combo	4	OP + LV + BZ
NapFix	2	OP + ML + BZ
Colleague	4	OP + BZ
Combat	5	OP
Cydectin	3	ML
Abamectin	4	ML
Ivomec	5	ML
Ivermectin	5	ML
Genesis	4	ML
Weanerguard	3	ML
Eweguard	3	ML
Firstmectin	4	ML
Abamax	4	ML
Moxidectin	3	ML
Paramectin	4	ML
VetMec	4	ML
Zoomec	4	ML
Maverick	4	ML
Moxitak	3	ML
Sequel	4	ML + LV
Absolute	4	ML
Moximax	3	ML
Sheepguard	3	ML
Paramax	5	ML
Noromectin	5	ML
Rycomectin	4	ML
Levamisole	6	LV
Valbazen	6	BZ
Duocare	5	BZ + LV

Nilverm	6	LV
Scanda	5	BZ + LV
Combination	5	BZ + LV
Alben	6	BZ
Switch	5	BZ + LV
Combimax	5	BZ + LV
Combi	5	BZ + LV
First Drench	6	LV
Albendazole	6	BZ
Panacur	6	BZ
Nucombo	5	BZ + LV
Combo	5	BZ + LV
VetMec Dual	5	BZ + LV
Fenbendazole	6	BZ
Ripercol	6	LV