



CLOVEN HILLS

450 Haydens Rd, Nareen VIC 3315

Purpose bred for greater lamb production

"Flexible, profitable, sustainable"

Newsletter

AUGUST 2016

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Introduction

Genetics are like cars. Two people buy the same make and model, but drive them completely differently and take them on separate roads. The focus of this newsletter is to give consideration to some of the critical success factors for optimising the genetic potential of your sheep. We firmly believe that it is a game of setting realistic targets within the constraints of the system and achieving them cumulatively, through picking up an additional 2-5% at each of several critical steps along the production cycle, rather than a silver bullet.

The most refreshing thing about Kate's recent trip New Zealand was the insight gained into the mindset of the sheep breeders she visited. Whether it be responding to a problem or increasing productivity, the rigour and speed with which they sought information, understood it and the associated risks, and implemented a plan, was very impressive. Hence they were very comfortable with using information to select genetics. They were also very willing to share information and were very good at articulating it.

With this in mind, we thought it was a good opportunity to use this newsletter to articulate what Cloven Hills is doing and why (stud and commercial flock). As a stud, our job is to assess what the market wants, set targets for our breeding operation, implement, measure &

assess livestock, analyse the information across the targets and multiple traits, then cull or select animals. We see this as our job so that clients know they can drive our genetics with the confidence that they will do the job they need them to. This newsletter is a bit of a look under the bonnet and we hope there might be one or two points which are handy for your commercial lamb operation.

Why select CLOVEN HILLS?

Cloven Hills 2016 Ram Sale will offer:

- Top indexing rams
- Selected on type
- Rams sourced from over 2000 LAMBPLAN recorded ewes
- Only the top 25% of ram lambs born
- Replacement guarantee
- Brucellosis accredited
- Approved OJD vaccinates, abattoir 500 -ve, eligible to enter all states.

Kate's look across the Tasman Fence

The philosophy of asking which rams are going to give my farming system the best gains and resilience was at the centre of all my discussions when recently visiting 13 of New Zealand's top prime lamb and maternal sheep studs.

Resilience and structure were top of mind for farmers in the North Island, where we witnessed one of the worst seasons for facial eczema. Caused by a spore on ryegrass that damages liver function, we saw ewes going down, and heard of widespread stock losses and reduced scanning percentages. Other issues their unseasonably humid, wet summer had brought, were high parasite loads and viral pneumonia. Consequently, breeders were responding by purchasing stock where studs had been selecting for negative WEC and resilience to Facial Eczema.

The South Island had completely different issues, but again was using a blend of science and physical selection to make production gains. It is one thing to talk about the challenges and they were certainly having plenty in the North Island, but the rigour and speed with which they all sought objective information, understood the detailed information and the risks, and implemented it was extremely impressive.

It wasn't necessarily about long winded analysis or benchmarking but looking for objective information that would enable them to move along the improvement curve.

Whether we were in the North or the South, talking to a local Committee member on their Beef and Lamb (NZ MLA equivalent), stud or commercial breeder, they were very clear about:

1. How their current farming system and sheep performed (ie. stocking rate, weaning %, dry matter (DM) produced, farm surplus (NZ GM\$))
2. Where the priorities for improvement were short and long term (ie. Increase winter DM, lamb growth, grow farm)
3. How they were going to achieve the improvement (ie. soil test & fertilise, genetic selection for fertility and reducing adult weight).
4. What they expected to achieve and the potential risk (ie. stocking rate, weaning %, dry matter (DM) produced, farm surplus (NZ GM\$)).

CLOVEN HILLS PERFORMANCE IN FERTILITY AND SURVIVAL

a. Fertility – 3000 ewes

- Last 2 years pregnancy scanning all ewes born between 2007-2014 averaged 175% SIL (Figure 2).
 - 94% in first cycle, separated into early & lates for ease of management
 - Breakdown: dry 2.9%, single 26.2%, twin 65.3% triplet 5.6%.
 - Comparing preg scan status to the number of lambs recorded, the preg scan error rate is 3%. This equates to 6% more lambs born, mostly triplets and twins going undetected. This would increase our scanning % but reduce our survival rates.
 - Ewes that lamb as a ewe lamb have an increased lifetime pregscan of 12%.
- 2015
 - Total survival 89%, marking 155% incl. preg scan dries and dries at marking
 - Twins survival 86%. Within this, lamb survival in ewes under 2.9 condition score reduces to 80%.
 - Average birth weight from 2013-2006 drop ewes 5.7kg vs 4.5kg from 2014 drop ewes.
 - Twin ewes run at 8.2 ewes/Ha, Singles 11 ewes/Ha, Triplets 5.7 ewes/Ha.
 - 2015 Dystocia 1.5%



Fig 1. Preg scanning, condition scoring & vaccinating, Peter Wathen and Chris May 2016.

- Selection does work
 - All stud ewes assessed for flight distance and given a mothering score. Dams of the lambs that died had a longer flight distance and worse mothering score.
 - Triplets survival 62% (wet & dries). Despite weighing stud lambs at birth, and them having worse shelter their survival was 6% better than commercial lambs.
 - As we run some singles with our twins due to paddock management our singles survival is 106%.
- Ewes that lamb under blue gums have a higher survival despite increased foxed numbers and minimal checking during lambing.

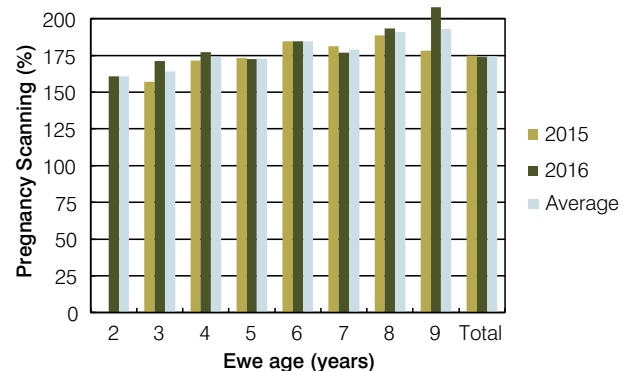


Fig. 2. Demonstration of the high fertility of Cloven Hills ewes with total scanning percentages of 175% for the past 2 years.

b. Growth

- i. Mature ewes in 2015 weaned ewe lambs averaging 34kg and wether lambs averaging 36kg at 102 days. 85% were multiples 15% singles. Ewe lambs grew at 280g/day wethers at 299g/day from birth to weaning (assuming a 5.7kg BWT) at a stocking rate of 18.5 DSE/Ha.
- ii. As we now use EID tags in wether lambs we can not only quantify that one group of lambs on an improved high quality pasture is growing at 400g/day versus lambs on onion weed at 200g/day, but identify the lambs within each of these groups which vary far more widely.

iii. Given most of our lambs are multiples and we lamb late July/early August, the main risk to our system is a failed spring. This is particularly important given we have been in the development phase of improving the pasture base and building soil fertility of our farm. In tight feed situations such as the last few years, we have used EID to autodraft our wethers and ewe lambs on growth rate. This has allowed us to:

1. Prioritise mouths on diminishing spring feed.
2. Develop feed budgets using available pasture and supplementary feed options. The one upside of two failed springs was that we learnt what did and didn't work in 2014 and did a better job of it in 2015.
3. Recognise the value of growing more high quality feed during the winter and continue with the program of building soil P levels and sowing new perennial pastures. One component which has delivered good results for us has been containment feeding during the summer and autumn which has built a feed wedge for the winter and translated directly into higher birth weights, faster lamb growth rates, heavier weaning weights and ewes better maintaining their condition throughout the year.

OPTIMISING FERTILITY

As a maternal stud, selecting genetics with the objective of enabling clients to have profitable prime lamb enterprises, we regularly discuss and debate where our ultimate fertility levels should be. Once you go over 180% scanning, the number of triplets increases. Research shows that 200% scanning generally equates to just under 20% triplets. Hence, our aim is to optimise fertility, not maximise it. We want more twins, less triplets and good survival. Research indicates it is possible to select for more twins and fewer triplets. Compared to NZ data Cloven Hills have 8% more twins, 1% fewer triplets and 7% fewer singles.

We have definitely improved multiples survival by increasing ewe condition and nutrition. Good nutrition late pregnancy increases survival by 15%. Lambing at a time that gives you the best chance to do this is another thing to consider.

Survival is 70% governed by birth weight, and birth weight is highly correlated to ewe condition score. Over the past 5 years a big focus for us has been selecting productive ewes that maintain their condition.

If you have the genetic potential in your sheep, managing condition score will have a compounding beneficial effect. For 2000 ewes, lifting scanning percentages from 140 to 160 will give you about 195 more lambs, lifting twin survival from 65 to 85% in conjunction with this, will increase this to 540 lambs.



Fig. 3. Cloven Hills Ewes early Feb Prior to Joining

Increase fertility within your system by:

- Selecting Cloven Hills genetics with proven ability to conceive and rear multiples.
- Evaluating time of joining. This is a major determinant of conception, with rates increasing by approximately 10% each month from November through to April.
- Weaning lambs at 10-12 weeks of age to allow ewes to recover and gain condition prior to going into summer.
- Flushing ewes with 200 g/hd/day lupins 2 weeks prior to joining and for the first 2 weeks of joining.
- Feeding Rams 150 g/hd/day lupins for 6 weeks prior to joining.
- Aiming for ewes to be in Condition Score > 3.2 at joining and be on a rising plane of nutrition.
- Joining on green pick and even consider containing ewes prior to joining to allow green pick to persist during mating (season dependent).
- Selling dry ewes at scanning.
- Wetting and drying ewes at marking to remove ewes which have not reared a lamb (these ewes are generally less likely to rear a lamb than drys at scanning). Likewise, identify ewes with structural problems or bad udders for culling at weaning.
- Running ewes in mobs based on condition score and pregnancy status to prioritise allocation of feed and shelter up to and including lambing.
- Lambing down multiple ewes in smaller mobs, with lower stocking rate, better shelter, more privacy/less traffic and enough FOO for their energy requirements.
- Aiming to start lambing a month before peak pasture production occurs.

Maximising GROWTH

Having ewes in better condition improve milking and lamb growth rates. At weaning, we separate ewes into very skinny (CS <2.7), skinny (CS 2.7-2.8), medium (CS 2.9-3.1) and fat (CS 3.2+) and prioritise feed to skinny ewes. Fat ewes are contained in laneways with straw early, and given a maintenance ration of grain at best. If possible, we keep young and old ewes separate, as they tend to be more at risk of losing condition. This was particularly important in tough springs, as it is the cheapest way to put condition on ewes, save grain and enable paddocks to get away once the break comes.

Having used match maker to identify which lambs belong to which ewes in our commercial flock we have found the following: Fat ewes wean lambs 0.5 to 1kg heavier than medium ewes. Medium ewes wean lambs 6-7 kilograms heavier than skinny ewes. Skinny ewes wean lambs 3-4kg kilograms heavier than very skinny ewes. Minimizing the number of very skinny and skinny ewes improves lamb growth rates. Ewe weight did not have any correlation to weaning weight.

Wether lambs weaned 2kg heavier than ewe lambs, multiples weaned 2.4-2.8 kilograms lighter than singles. Hence if you are selecting for fertility it is critical to also select for growth.

For our situation, using EID, having one self-replacing flock and one joining for all mature ewes in mid-February simplifies management through mobs based on condition score and pregnancy status. This enables us to hit more targets more often.

By lifting the genetic potential for fertility in your flock, it becomes more important (particularly in tough seasons) to not only have the feed systems to support more multiples, but spend time planning. If you can prioritise the right mouths on the right paddock it is easier to turn lambs off more cost effectively and generate more profit for the business.

EFFICIENT EWES

A moderately sized ewe drives the efficiency of our system. Our on-farm data has shown that ewes weighing 61-65kg at weaning are achieving efficiencies of 90% and weaning 170% lambs (Figure 4). In this 2014 match maker trial, the average ewe efficiency was over 80% with 150% lambs weaned.

In New Zealand, they have been rewarding moderate framed sheep for some years. Having a higher cost of land, stocking rate is critical, many citing how an increase in adult weight from 60 to 80kg reduces your stocking rate by around 25%, not to mention handling issues.

A highly fertile, moderately weighted ewe plays a critical role in driving profit through putting large numbers of lambs on the ground under high stocking rates and optimising kg lamb/ha.

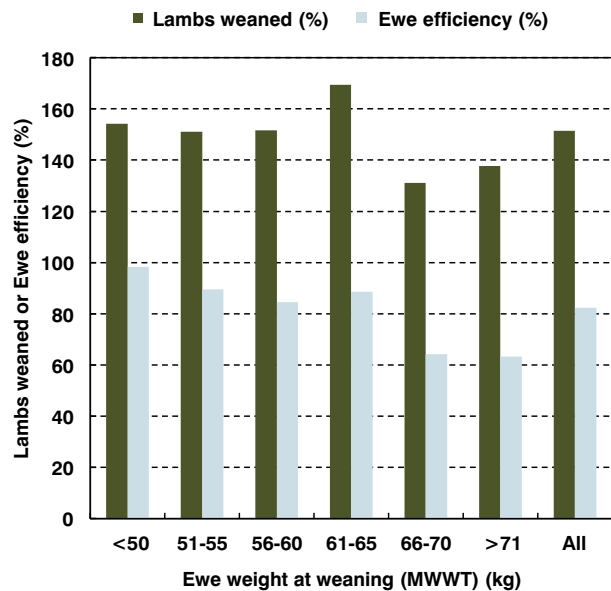


Fig. 4. Effect of ewe weight on ewe efficiency and numbers of lambs weaned.

The CARCASE Consumers want

We continue to place selection pressure on ensuring lambs and ewes have good shape, yield well and are the article meat buyers want. We have followed several consignments through the abattoir again this year and are linking the data back to sires and dams to inform future breeding decisions. Whilst this additional monitoring and data collection has a cost to our business, we think it is a good investment of time and effort as we are always keeping an eye on the future when thinking about our breeding direction, as change takes time. Similarly, we have continued to supply AI sires to the Sheep CRC which are assessed for many genomic traits including meat eating quality research on intramuscular fat (IMF) and tenderness (Shear Force).

Interestingly, in the South Island of New Zealand, some abattoirs are rewarding meat yield and all breeders are able to CT scan live rams. One breeder also referenced the UK where they have doubled the gains in meat yield by CT scanning bloodlines as it is twice as accurate. This is not yet available in Australia, nor is measurement of eye muscle area, which is believed in New Zealand to be more heritable than eye muscle depth and less variable with seasonal conditions.

Australian Evaluation of Puketauru Ram 529/13

Kate's recent trip to New Zealand with Rick Gates, from Gates Performance Genetics, Armidale NSW, was a not only a fantastic opportunity to look for new maternal genetics and bloodlines but to meet the leaders in maternal genetics in NZ. We spent time with many excellent breeders who we will continue to talk to.

The discussion on what different studs are doing and how and why they are doing them, are extremely valuable and we look forward to some of them visiting us.

For next year's program we plan to use Ram 529/13 from the stud Puketauru owned by Tom & Anne Abraham. About 20 years ago Kate spent a summer working for Philson and Judy Sherriff who had a Coopworth and Angus stud, "Pine Park", near Marton. Their son Edward and his wife Kirsty now run Pine Park. When talking to both Edward and Philson about what we were looking for on our trip, they both agreed they didn't have a current sire that they were happy with crossing the ditch. However, they suggested talking to their neighbour and competitor Tom Abraham. Like Pine Park Puketauru is one of the original Coopworth Studs.

In February 2016, all the North Island maternal breeders catch up and bring their best sires to one of their places for everyone to evaluate. From these, they select a few rams that the breeders use as a linkage sire, so progeny can be better evaluated across flocks. Edward was very impressed with Tom's rams at this day, as his structural correctness in the rams and flock is excellent, his type was also very good and matched what we were looking for. Puketauru numbers in SIL are very good and improving all the time. When we visited Puketauru I was similarly impressed with Tom's style of meaty Coopworth. Some of Tom's 2014 drop rams are pictured in Figure 5. We are currently waiting for 529/13 to come out of the AI Centre and we will get a photo posted on our website. We have also offered 529/13 to Australia's Coopworth breeders, which will ensure we continue to get good linkage across stud flocks and a relative measure of his performance in LAMBPLAN.



Fig. 5. Some of Tom and Anne Abraham's 2014 drop "Puketauru" Coopworth rams, near Marton, NZ.

High Ranking for Cloven Hills in new MCP+ index

Sheep Genetics reviewed the Maternal Indices in LAMBPLAN in 2015 and as a result released updated indexes in May 2016 to replace the Maternal \$ Index, namely Border Leicester Cross (BLX), Maternal Carcase

Production (MCP) and Maternal Carcase Production + (MCP+). We have adopted the Maternal Carcase Production + (MCP+) Index for the following reasons.

1. MCP+ targets self-replacing production systems where fertility and growth are still the key priorities
2. MCP+ keeps adult weight constant rather than increasing it as the Maternal \$ Index did. Given adult weight is highly positively correlated to growth it enables better selection of sheep that have early growth and then pull up.
3. MCP+ puts more emphasis on carcase traits, looking to increase fat and muscle area, which is again more profitable for increasing yield and in line with what abattoirs are wanting in terms of yield and cover.
4. MCP+ aims to reduce WEC as it is assumed in the index most enterprises are located in higher rainfall areas and/or high input management systems.
5. MCP+ slightly increases in clean fleece weight.

Table 1 shows the contribution of each trait to economic gain using the MCP+ index over ten years. As the heritability of different traits varies widely, the increases you achieve don't necessarily reflect the weighting of importance. For example NLW (number of lambs weaned) or fertility is only 4% heritable versus growth which is 20% for WWT and 24% for PWWT. However an index is ONLY a tool, as always, we suggest that you look at your priorities for selection and also use the relevant ASBV for example WWT if you are interested in increasing weaning weight.

Cloven Hills has the equal second highest number of sires in the Top 150 Elite sires of the MCP+ Index. Information on some of these sires is presented in Table 2.



Fig. 6. Kate & Rick Gates from Gates Performance Genetics, Armidale, NSW (who annually use Cloven Hills genetics in their AI program) visit the Twin Farms Team Russell, Andrew, Catherine & Toby Welsh. Cloven Hills has used Twin Farms sires who are top ranking rams in Australia and NZ.

Table 1. Expected gain over 10 years in traits (ASBVs) through using the new MCP+ Index.

| Trait | Gain over 10 years |
|-----------|--------------------|
| BWT (kg) | 0.14 |
| WWT (kg) | 1.9 |
| PWT (kg) | 3.11 |
| MWWT (kg) | 0.98 |
| AWT (kg) | 0 |
| PFAT (mm) | 0.27 |
| PEMD (mm) | 0.75 |
| CEMD (mm) | 0.87 |
| YNLW (%) | 0.03 |
| NLW (%) | 0.03 |
| PWEC (%) | -25.82 |
| YGFW (%) | 0.09 |
| YCFW (%) | 1.21 |
| ACFW (%) | -1.61 |



Fig. 7. Cloven Hills Ram Sale 2015.

Table 2. Cloven Hills sires in the top 150 Australian Maternal Sires. Cloven Hills currently has the second highest number of top performance maternal sires in Australia.

| SIRE ID | MCP+ | M\$ Index | BWT | WWT | PWWT | AWT | PFAT | PEMD | PFEC | PSC | NLW | YNLW | MWWT | BT |
|------------------|------------|------------|-----|------------|-------------|------|------------|------------|--------------|------------|-----|------|------------|----|
| CM00092011111216 | 154 | 138 | 0.4 | 8.1 | 12.9 | 13.2 | 0.6 | 2.8 | -82.3 | 4.2 | 4% | 8% | 1.5 | 2 |
| CM00092014140919 | 150 | 139 | 0.6 | 8.5 | 13.1 | 14.6 | -0.5 | 1.4 | -60.9 | 3.6 | 12% | 15% | 1.0 | 2 |
| CM00092011110043 | 149 | 139 | 0.4 | 8.3 | 13.1 | 14.5 | -0.2 | 1.2 | -71.7 | 4.1 | 14% | 14% | -0.3 | 1 |
| CM00092013130838 | 149 | 138 | 0.2 | 7.9 | 12.2 | 13.7 | 1.0 | 2.3 | -50.7 | 5.0 | 11% | 11% | 0.2 | 4 |
| CM00092013130574 | 149 | 134 | 0.3 | 9.0 | 13.3 | 12.9 | -0.8 | 1.9 | -22.3 | 5.6 | 4% | 9% | 1.5 | 2 |
| CM00092014140511 | 147 | 137 | 0.4 | 8.0 | 12.5 | 14.0 | -0.4 | 1.5 | -42.4 | 3.6 | 15% | 17% | -0.4 | 2 |
| CM00092011110345 | 146 | 132 | 0.3 | 8.9 | 13.0 | 11.7 | -1.6 | 1.3 | -19.3 | 6.8 | 3% | 9% | 1.3 | 2 |
| CM00092013130752 | 144 | 132 | 0.3 | 7.6 | 11.9 | 12.4 | -0.8 | 1.6 | -33.5 | 5.3 | 5% | 12% | 1.3 | 1 |
| CM00092012120403 | 144 | 133 | 0.3 | 6.8 | 11.8 | 13.0 | 0.3 | 2.1 | -57.9 | 3.9 | 8% | 9% | 0.0 | 2 |
| CM00092011110093 | 142 | 135 | 0.5 | 8.2 | 13.2 | 15.9 | -1.1 | 1.1 | -53.2 | 3.9 | 9% | 14% | 0.6 | 2 |
| CM00092013130842 | 142 | 139 | 0.6 | 9.5 | 15.1 | 18.5 | -1.1 | -0.1 | -81.0 | 4.3 | 10% | 13% | 1.1 | 2 |
| CM00092010100546 | 140 | 135 | 0.4 | 9.1 | 13.6 | 14.9 | -0.8 | 0.0 | -47.9 | 4.4 | 12% | 5% | 0.1 | 2 |
| CM00092013130260 | 140 | 131 | 0.5 | 8.0 | 12.0 | 13.9 | -0.9 | 1.5 | -63.5 | 2.4 | 5% | 4% | 0.2 | 2 |
| CM00092012121356 | 139 | 131 | 0.6 | 9.1 | 13.9 | 16.2 | -0.5 | 1.7 | -63.6 | 5.3 | 0% | -3% | 0.2 | 2 |

Top 10%

Bolded top 5%



CLOVEN HILLS 3rd ANNUAL RAM SALE

**MONDAY,
10 OCTOBER
1:00PM
VIEWING FROM
11AM**

CASTERTON SHOWGROUNDS, ISLAND PARK

We were very happy with the results of our 2015 ram sale, which was held at Island Park, Casterton. 106 rams were offered, with 99 sold at an average of \$1070/hd. Rhiannon McGrath and Vinnie Joyce, Sandford were repeat buyers and paid \$2200 and \$2000 for lots 51 and 69, which topped the sale. Volume buyers included Nick & Ian Harvey, Strathdownie; David Jenkins, Peshurst; David and Celia Scott, Poolajelo; Colin, Jill and Fiona Smith, Grassdale; and Andrew and Michelle Edgar, Nareen. We were very appreciative of the strong support shown to us by the many locals who came as either first time or repeat buyers.

Strong demand for our rams continued post-sale, and we sold out of rams as they went to new homes locally, in SA New South Wales and Gippsland. Clients selected rams with a good balance of style, consistency of type and performance, with the capacity to simplify their breeding operation. A common comment from clients who have been using Cloven Hills genetics for several years is that the lambs are doing "as well as their terminals", with the ewe portion growing into nice young ewes.

Island Park is a fantastic venue to hold the sale and we would like to thank the Casterton P&A Society for continuing to allow us to use the facilities. **This year our sale will be held on Monday 10th October, where we will be offering 150 rams for sale. The rams which will be offered for sale at the Auction can be viewed at our Open Day on Friday 30th September, 2016.** More information will be on our website www.clovenhills.com.au in the coming months.

Cloven Hills genetics deliver profit (\$/ha) through:

- Fertility, survival and mothering to conceive and rear large numbers of lambs
- Rapidly growing lambs which achieve target weights quickly
- Muscle, shape and cover to deliver high yielding carcasses customers want.
- Moderately sized, efficient and resilient ewes which can be run at high stocking rates under tough conditions
- Quality Assurance

Simplifying the system to hit the targets which drive productivity

We will be offering ewe lambs from November 2016

**Ewe lambs by Sires in top
5% of MCP+ index and out
of ewes of which 70% are
recorded in LAMBPLAN**

**FOR BOOKINGS OR TO FIND OUT MORE:
CONTACT RICK SMITH ON 0447 770 339
OR KATE ON 0409 784 340**

CONCLUSION

We hope this newsletter, has presented some insights into the factors we see as important for achieving the levels of production we continue to observe at Cloven Hills. Moreover, linking our calendar of operations with the pasture growth curve for our area makes it much easier and cheaper to run higher stocking rates without compromising ewe nutrition, which drives fertility, survival and lamb growth on mum. As some people move to a maternal system or refine their current one, we enjoy assisting clients work through their objectives and what it means for their management calendar. As we have found, having a fresh set of eyes can often help crystallise what has been sitting amongst many thoughts. However it's often finding that time to discuss the scenarios, prioritise, decide and then plan what to do. We are more than happy to help if we can, so please don't hesitate to give us a call or email.

Finally, we also looking at starting a discussion group on prime lamb sheep production, if this is something you might be interested in please let us know. Key questions are: What specific areas interest you? How often? Do you want it to be face to face, online or by phone or a combination of both?



Cloven Hills sires balancing fertility, growth, shape & structure



2015 Sale Rams at Open Day



Kate visiting Steve Wyn Harris at Maternal Stud Marlow, Wypuk, NZ



Some 2015 sale ram lambs in the yards for assessment in Feb 2016



2015 Sale Rams in paddock



Top 150 & Sale Sire Cloven Hills 11-43 MCP + Index 149