

## SIMON CARTHEW - OUR FUTURE DEVELOPMENT



For those of you who don't know me, my name is Simon Carthew (the one with the two children hanging on) and following is a rundown on our breeding programs and future developments on Turnberry Farm Australia and NZ.

I'd like to touch briefly on the importance of genetics in your farming systems.

Then look at some of the issues in the breeding industry at the moment.

Next to give you a thorough insight into Turnberry NZ, the genetic engine.

And finally Turnberry Australia - what role does it play and where to in the future.

**Genetics play a crucial role in the overall profitability of our farm operations - and that's the bit that turns my wheels!!**

In NZ it's been calculated that a 2% genetic improvement a year, at present prices, spread over 10 years would add up to an additional NZ\$196'000.—income for the average sheep farm:

- 80% of your on farm genetic progress will come from the rams you use
- 15% from the ewe hogget selection
- 5% from the ewe selection

That gives you a handle on the importance of ram selection (or more importantly breeder selection).

A ram is essentially a wool wrapped parcel of genetic material. The outside gives us some information such as conformation, wool type, structural soundness - but there are many traits such as lambing performance and disease tolerance that you can't see. What we are really interested in is what contribution the ram can make to the production and economic performance of your flock through his progeny.



Remember a Porsche with a Mini engine might look good from the outside but doesn't go very well!

If we need proof that genetic improvement works and can be done, we need to look no further than the dairy industry (again using a NZ example).

They have taken the average genetic potential per cow for milk fat production from about 115kg per cow to 160kg per cow in 30 years. This equates a 1.3% genetic improvement in this trait per year nationwide.

A similar improvement in the sheep industry to that achieved in the dairy example would have meant moving from 95% lambing to 150%. The actual movement has been from about 95% to 120% over 30 years (they quote 127% but I understand hogget lambs are also included in the total!).

Also contemplate this: In New Zealand a sheep property carrying 15 su/ha producing 300kg meat/ha (140% plus cull ewes & 100kg wool/ha incl. slipe wool) has a total of 400kg product. Feed grown to produce this is say 11500kg DM/ha giving a cost of 28kg DM per 1 kg of output. Dairy is 15-15.2kg DM per 1 kg of output in comparison (based on 400kg MS/cow and including the culls, surplus calves wintering feed and replacement feed).

The dairy industry in NZ first realised the importance of genetics in the 50's - we can see where it's taken them

## Efficiency – producing the desired result with a minimum waste and input

That's our single minded focus here at Turnberry.  
However, we have a few problems as I see it.

1. **Our sheep industry** is heading the way the American Dairy & Beef industry went, ie. Higher performance through breeding bigger animals. Until breeders nationally supply more mature live weight information and our genetic evaluation system therefore can penalise larger animals, I understand we can't turn this around.
  - a) Breeding bigger, later maturing animals is in total conflict with the general Australian pasture growth curve. The current supply/demand is all wrong. We need to look at this in more depth!
  - b) Selection for growth BV's (especially later growth) will increase mature live weight. Big framed sheep don't hack the pace like smaller sheep seem to.
2. **Soft sheep.** Sheep that only perform under favourable conditions. I watch with interest most breeders ad lib feeding their stud rams hoggets, even spreading them out because we all know they grow better with less competition . Firstly this leads to distorted performance information, secondly they're identifying and selecting the top animals under the ad lib favourable environment. They're then expecting them to breed daughters in your commercial flocks that have to cope with a completely different set of circumstances.
3. **Longevity** - an extremely important profit trait for commercial farmers. However there's a direct conflict with me, your breeder, because I need to keep my generation interval as low as possible to maximise our genetic progress. You may be interested to look at our sire summaries, the impact BLUP (Best Lineal Unbiased Production) has made on the age of the dams of the sires we're selecting. Even, shock-horror, we've used a single. SIL is so powerful now in predicting how an animal is going to breed based on all it's ancestral relations before it's even bred. However, again we don't want to end up like the American Dairy Industry where cows are so genetically fired up that they aren't lasting.
4. **Wastage.** Possibly a huge animal welfare issue for us in the future. Not withstanding the obvious economic cost to our farming systems.

## TURNBERRY NEW ZEALAND - THE GENETIC ENGINE

Ok, so we've covered a few negative issues, let's now focus on the positives and what we at Turnberry are doing to breed better sheep now and for the future.

We believe, to achieve high net income per hectare from breeding ewes on hill country, it will most commonly be achieved with ewes being mated at modest live weights, having a high % of twins and run at realistic stocking rates. To this end we have modelled our Coopworth breeding flock.



It's shape up or ship out around here.



All our recorded ewes are commercially driven, ie no preferential treatment given. They are farmed with our commercial ewes at all times except single sire mating and lambing (for recording purposes). We haven't got breeding cows in our farming system so our sheep are our cows! (and that's quite abnormal on our class of country)

One of our clients talks of our sheep being "bomb proof". I've stuffed the management up at times - but they still produce.

I think that ability to perform, even in less than favourable conditions is what sets our sheep apart from the rest.

## Ram Hoggets

Our ram hoggets are our key genetic drivers. As I said earlier, 80% of the genetic progress will come from the ram, no different in our flock.



Our ram lambs spend their entire recorded life on the hills. They receive a managed exposure to worms, they aren't ad lib fed - again, we want to identify superior animals that excel under true commercial hill country conditions.

## Ewe Hoggets

Potentially 15% gain to be made here through selection. I think hogget mating is the next significant area of gain to be made from this class of stock. For us it reduces our generation interval and hence maximises our genetic progress. Research also shows, hoggets which lamb have a more productive life.



I believe that we are arriving at the stage where we should asking ourselves

- how many lambs do we want ?
- how few ewes and ewe hoggets do we need to achieve that result?

However, this isn't a black & white subject. There's downsides in your management systems to make this work. We're aiming to make it work. So watch this space!

Now, I've painted a very general picture of what happens with our recorded sheep but there really is a bit more to it than just that.

### **Animate:**

All our ewes and hoggets are mated according to Animate - a computerised dating agency if you like. This service has been introduced to get the best possible mate selections and reduce the possibility of inbreeding. For some time now we have had concerns that nearly all the outside sires we have been using haven't been performing in our flock and environment (ie look at our sire summaries).

This isn't to say that in the future there won't be stand out sires which can contribute to our breeding objectives. But currently we haven't seen any evidence to support using a lot of outside sires (just enough to keep our linkages).

Hence, if we close the flock, matings now are important to give us genetic variation for the future.

## **Artificial Breeding:**

Since quarantining the farm in 1996 any new genetics have been in the form of semen or embryos. Every year we source outside semen from the top sire reference rams from the North and South island. We are the only breeders that I know, that are consistently running embryo transfer programs to multiply up top genetics.

There's high gains to be made from this. We are ideally positioned because we're very experienced in this system now. Some of the downsides are: expensive, risky, high management cost, stuff farm system up, lower performance levels (ie ewes in our flock that are AI have approx. 20 lower conceptions compared to naturally mated ewes).

## **Efficiency**

As already mentioned, a real curly topic. Recent trial work out of Lincoln suggests an 18% production advantage by farming modest live weight ewes (ie 60kg vs 70kg). I won't go into specifics but this work is most exciting and backs up our beliefs relating to ewe lightweight.

Mature live weight efficiency is being developed here by taking individual ewe weights at mating. With the aim of getting a breeding value calculated. Possibly look at scanning and weaning weights also to take an average weight for the year as being more accurate.

We select only moderate frame size. We avoid selecting big rams and try to interpret growth information based on size of sheep. We're very happy with the type or phenotypic qualities of the rams we're selecting ie they're robust I think.

Other genetic efficiency is well identified through SIL.

## **Diseases**

### Internal Parasites

We have 2 Animal Health Consultants and a good friend, Greg Mirams who's Mr. FecPak. Always a real debatable issue.

We've watched breeders uptake of Wormfec (that's breeding for Worm Resistance) and then dump it because of the negative corrections with other productive traits.

Our approach has been breeding for tolerance ie exposing those animals to worms and breeding those that are the best performers.

We've carried that one step further in the last couple of years by weighing ram lambs every two weeks from weaning. Those animals that maintain consistent weight gains don't get drenched and we assume have a greater tolerance to worms (based on Ruakura work).

This raw data I have then used as another criteria when selecting our keeper rams. I hope to put together a breeding value for our clients in the near future.

Chemical usage is going to be a big market place issue in the years to come. We may have to look at Wormfec as a means identifying and culling the worst contaminators in our flock.

### Footrot

We are obtaining genetic markers for footrot from our sires. With DNA they can identify rams on a scale of 1-5 that are more or less susceptible. As expected our rams have performed very well - we've been paranoiac about feet since day one. This information is particularly significant for our Australian clients.

All sires selected for Australia have predominantly been 1:1 alleles.

## **Wool**

Wool is still proportionally over 20% of most hill country farmers gross income. We still think it's important. We're still making significant gains in wool production. We send away mid side samples off all our sires we use, weight all hogget fleece and cull anything with undesirable wool. Our clip is becoming finer (although our genetic trend graph doesn't show this). We may just be pushing our sheep harder.

## **Saleable Meat Yield**

We aim to put significant selection pressure in this areas moving forward. We will continue muscle scanning our ram hoggets but now also have the opportunity to progeny test sires for saleable meat yield. Prior to the workshop Dad, Jed and I were invited to visit Craig Hicksons Progressive Meats Lamb Processing Plant. Craig has fully converted his plant using flash Processing Technology from Finland. This will revolutionise the meat industry and for us, the breeders give a cost effective saleable meat yield progeny test. To give you an idea of what impact this could have for you the commercial farmer, it has been estimated there's currently around \$14 difference between the top yielding lambs and the industry average. So extrapolated out even further you could assume there was over \$20 difference between the top vs poorest yielding lambs. That difference is just averaged out at present. All about to change.

## **Survivability / Mothering ability**

One of the real strengths of our sheep!  
This has been one of Dads "pets" and I guess it goes back 40 years ago when he used to have Romneys tied up all around the farm trying to mother on their own lambs. From day on he identified superior mothers. Mothers that could count!  
We are now at the stage where if MA recorded ewes loose their plastic tag at lambing we can read the brass tag while we're tagging their lambs - they stay that close!



Turnberry Farm, Australia

### Triplets - Profit or Pain

As scanning % go up so do the % of tripletting ewes we can expect within our flocks. Our sheep have the skills to handle three. The most concise data I have relates to 1997 to 1999 because they were kept separate.

		1997	1998	1999
% Ewes reared	3/3	64	56	66
" "	3/2	30	31	27
" "	3/1	5	8	6.5
" "	3/0	1	4	0.5

Lamb deaths expressed as a % of lambs born.

Total Lamb deaths within 3 days after birth 14.02%

Total Lamb deaths at birth 8.56%

Commercial triplet ewes over this period docked 250%.

### Longevity

No easy answers here.

By example we have 60 ewes 8 years and older still hacking the pace and in our recorded flock.

The older, high merit proven longevity ewes are the ones we're targeting specially for ET to keep those longevity genetics filtering in the system.

## **Systems**

### Recording Systems

Our computer generated index's and breeding values are only as accurate as the raw information that's been fed into them. Hence the importance of getting it right at the coalface.

We've tried and trialled several different electronic options in the last couple of years and have gone back to field notebooks. Sophistication is great as long as it constantly works (by example 5 faulty palm computers in a row!).

### DNA Parentage Testing

At approx. \$24 per animal tested the cost far outweighs the returns in our stud. I would argue that all the technology hype being pushed by some breeders is an excuse for lack of mothering ability within their ewes, they can't get close enough to the ewes to identify their lambs. We know with our sheep and our systems we are very accurate in identifying parentage.

However this technology does offer benefits namely:

1. ease of management at lambing/tagging time
2. ability to mob mate
3. 100% accuracy of parentage for 85% of the population
4. you have a DNA profile of your animals available and ready when genes are marked

We are DNA testing all our sires this year. We would probably look at everything if the price was closer to \$10 - just a matter of time.

Some of the downsides are:

1. 10-15% of animals you can't accurately determine parentage - wastage factor
2. no birth data to accurately calculate weaning weights, BV's
3. mothering ability - lambing time is one time of the year you get one on one contact with the ewe. Also you see feet, teat place, udder etc.
4. expensive

### SIL Indexes

Index's provide a useful summary of the overall economic breeding merit of animals across commercially important traits. However, the SIL index has been set up as a general index to cover all maternal breeds at different levels of performance.

Our role as breeder is to know what your breeding objectives are now but also to crystal ball gaze as to what's going to be important in the future.

We will be compiling our own index sometime soon. With the help of our clients and Peter Amer from Abacus Biotech we hope to put together something that is more financially tuned to our and your breeding objectives and relative economic values on traits that are our profit drivers now and in the future.

### Information Overload

Genetic progress has been described like a rudder on a ship. The more things you select for the slower the progress or it takes longer to reach your destination. We use an awful lot of information to select our rams - we have to get it right.

If we had all the information on the rams available at ram selling time it would be a logistics disaster. Hence, the importance for us to get a handle of each individual clients business as best we can pre select rams for that criteria.

Abacus Biotech has available software that will slot into SIL and help identify rams within our flock that best suits the needs of different types of clients. That may do away with us perhaps in the future. However its not easy pre selecting rams for every client.

#### Carthew Landcorp Lamb Supreme

We're committed to provide the best. That's why we've started there.



#### Crossbreeding

- There are limitless options now available to farmers.
- Use only the best genetics available. Poor pure breeds make poor crossbreeds.
- Cross breeding is best done at home. Composite rams will reduce the hybrid vigour effect. Also in most cases they won't have the same selection pressure as pure breeds.  
We've tried East Friesians and they didn't stack up. Not convinced there's enough objective info to try other breeds yet.

#### Future Aims at Turnberry

- keep pushing the boundaries on all fronts with our recorded sheep
- to achieve 200% lambs weaned from our commercial ewes on the hills whilst maintaining modes live weight
- drafting 80% of lambs direct to slaughter at weaning at heavier weights
- hoggets to reach the levels currently at with our commercial ewes
- keep striving for maximum efficiency ie Efficiency, noun, producing the desired result with a minimum waste and input.

## Turnberry Australia



### **Why are we there?**

We're in Australia because we like a challenge - there's a bit of adventure (kids love it), we saw a business opportunity, but most importantly we have a passion for what we do and believed we can make a difference.

It's been quite a whirlwind three years for us in Australia. Through this time we've faced a lot of new challenges and made plenty of new friends.

### **The issues at present:**

At present we're trying to set and define our breeding objectives in Australia and map our genetic pathway. With the help of our team, clients and others we have to crystal ball gaze six years ahead as to where the market will be. That's the time lag it takes from us reacting to a market signal until it's in your flock and able to respond. So it's pretty important we get it right.

Other consideration will be:

- Is this the best fit for my farming system?
- Does this mature animal enable it to carry food on it's back for the down times?
- Do you plan to finish all lambs to slaughter (with or without grain) or sell unfinished?

Don't forget:

- Fertility is still going to give the best return. A high fertility flock is the absolute best fit for your pasture growth curves
- Sheep need to be structurally correct and able to hack the pace
- Sheep production is 80% feeding, 20% breeding

Finally, at the end of our first workshop in New Zealand 5 years ago a young client came up to Dad and said "Listen, I don't understand a lot of the technical breeding stuff you've been talking about. But as long as I know you do and you're progressing forward you're on my team." So I'll focus on my strengths and what I like doing which is the 80% feeding - management bit and leave you to focus on yours.

I guess in a nutshell that's what it is all about and how we see ourselves as a ram breeder and team member in your farm business.

Bill, Simon & Pascale Carthew