



GENETICS DISCUSSION DOCUMENT FOR NCFE

Prepared for
NCFE Management Team

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This report was developed as a discussion document for the interim NCFE management group to determine a genetic plan and identify breeders to approach for ram selection.

Background

The interim livestock policy for the North Canterbury Future Farm (NCFE), given it was starting with no existing livestock, was a compromise between setting up the ideal system and livestock mix for the property, with the practical realities as to what stock would be available for purchase and when.

In April 2018, 1970 MA ewes were purchased and mated to 40 leased Mt Linton SufTex ram hoggets. A further 1487 in-lamb MA ewes (mated primarily to a SufTex type sire) were purchased from various lines. No particular breed preference was given; however, the majority of the ewe breeding line is Romney or Romney cross. Information collected to date on the ewe flock consists of pregnancy scanning data (flock level) and a sample line (n=~100) measured for live weight and BCS – the two-tooth ewes averaged 65kg and BCS of 4, mixed age ewes averaged 70kg and BCS of 4.5. The summary from pregnancy scanning is detailed in Table 1.

Table 1. Summary of pregnancy scanning 2018.

Pregnancy Scanning Summary 2018						
Group	Tally	Single	Twin	Triplet	Dry %	Scanning %
Two-tooths	598	217	345	31	5	158
MA	1276	283	872	120	1.2	185
1-year ewes	565	102	384	78	1	194

All ewes have been ear-tagged, colour coded by age group i.e. individual ID's unknown. A Sheep stock reconciliation summary is detailed in Table 2.

Table 2. Breakdown of ewe flock by age.

Ewe ear tag colours		
YOB	Colour	Tally
2012	Red	758
2013	Yellow	711
2014	Purple	755
2015	Orange	511
2016	Green	627

The goal of NCFE is to have a maternal flock that can produce its own replacements (n=1000). While existing ewe numbers are currently at ~3500 it is anticipated that in time this will grow to ~4000 breeding ewes. The proportion of ewes to be mated in 2019 to achieve the desired number of ewe replacements from born 2019 lambs, is estimated in Table 3 below. This is based on a conservative lambing percentage of 150%.

Table 3. Maternal sired ewe calculation.

Breeding plan		Lanercost	Sires needed
Number of ewe hoggets to enter flock 2019	A	1000	
How many ewe lambs are needed at weaning to select the required number of retained ewe hoggets or 2ths?	B	1500	
Therefore the number of Maternal sired ewe and ram lambs weaned needs to be at least... (= B x 2)	C	3000	
Number of ewes required to breed replacements			
Typical or conservative Lambing %	D	150	
Number of ewes mated to maternal rams to achieve at least "C" number of lambs (= C ÷ D * 100)	E	2000	20
Number of ewes available to mate to Terminal sire			
Total number of ewes mated on farm	F	3500	
Ewes available to mate to Terminal Sire (= F – E)	G	1500	15

Selecting the right genetics

Aside from the information presented in Table 1 there is currently no base performance data on the existing ewe flock. Therefore, in considering the preferred genetics for Lanercost going forward, the following questions need to be addressed:

1. The ideal flock for Lanercost would have the following overall attributes?
2. What are the main limitations to performance (labour, climate, grass growth)?
3. What actions could reduce these limitations, or must the limitations be accepted?
4. Will Terminal sires be used over a proportion of the ewes?

Once the traits of primary importance to NCF are identified the publicly available Leader List reports generated by Sheep Improvement Limited¹ (SIL) can help to narrow down suitable breeders.

Leader lists identify the top 200 high genetic merit sires for a number of indexes and goal traits (Appendix 1). There is an assumption that the individuals represented on this list will be from high performing flocks. It is suggested that NCF identify several flocks of interest and then these are approached, and further information is obtained on their genetic figures and genetic trend graphs; see Ram Buyers Guide Ram Selection in Appendix 2.

Whilst not all sheep breeders are represented on this list, those which meet the following criteria will be:

- Sires must have had progeny within the previous three years
- Sires must have recorded sire and dam
- Must be connected for the trait, or for all component traits of the indexes
- Must meet the minimum accuracy thresholds for trait or index

The Maternal Worth plus Meat index (MW+M) is summarised in Appendix 1. For this exercise, each stud has their sires represented in the table averaged and each sub index has the % band ranking. The MW+M index is made up the following sub-indexes: Dual Purpose Adult Size (DPA), Dual Purpose Capped Reproduction (DPCR), Dual Purpose Survival (DPS), Dual Purpose Growth + Adult size (DPG+A),

¹ Sheep Improvement Limited (SIL), is NZ's national genetic evaluation database, providing national across flock and across breed sheep evaluation identifying the best rams for economic traits.

Dual Purpose Wool (DPW) and Dual-Purpose Meat yield (DPM). The sub-indexes are of value when aligning potential flocks once the traits of most importance have been identified. However, it is worth noting that Growth and Reproduction are weighted most heavily in the overall index – see Appendix 2.

In acknowledging the NCFE breeding flock is in an establishment phase, the genetics strategy used in 2019 and perhaps 2020, may well change as information is collected going forward on the flock's strengths and weaknesses. It is possible to customise the search requirements for breeders using SIL's FlockFinder tool but is best utilised in combination with known base performance information. It may be that NCFE looks to lease some rams for 2019 until a suitable base breeding flock is established and a genetics strategy review is undertaken.

Managing the breeding flock going forward

It is anticipated that all ewes will be EID tagged by March 2019. When this is completed it will be possible to record individual animal data. Measurements to collect could be Live weight (LWT) and Body Condition Score (BCS) at key times, like: pre-mate, pregnancy scanning and weaning, in addition to pregnancy scanning information on all breeding ewes.

Information collected on the ewe flock can then be used to develop A and B flocks: for example, a ewe that scanned a single but was in poor condition at weaning or an ewe that scanned a single for two consecutive years. Using this information wisely will result in a more efficient A flock producing more and better lambs. Meanwhile, the B flock can serve as a flexible class of stock should that be required or ultimately replaced as the ewe breeding flock strategy set by the management group is achieved in time. Initially, due to insufficient information on which to base mob decisions, ewes could be selected for the A mob based on a visual appraisal as well as a BCS at pre-mating.

Consideration could also be given to DNA sampling approx. 10 ewes from each year cohort to determine the base genetic merit of the flock. This information could be used to aid in the screening process for A and B mobs.

Appendix 1. Sire Leader list

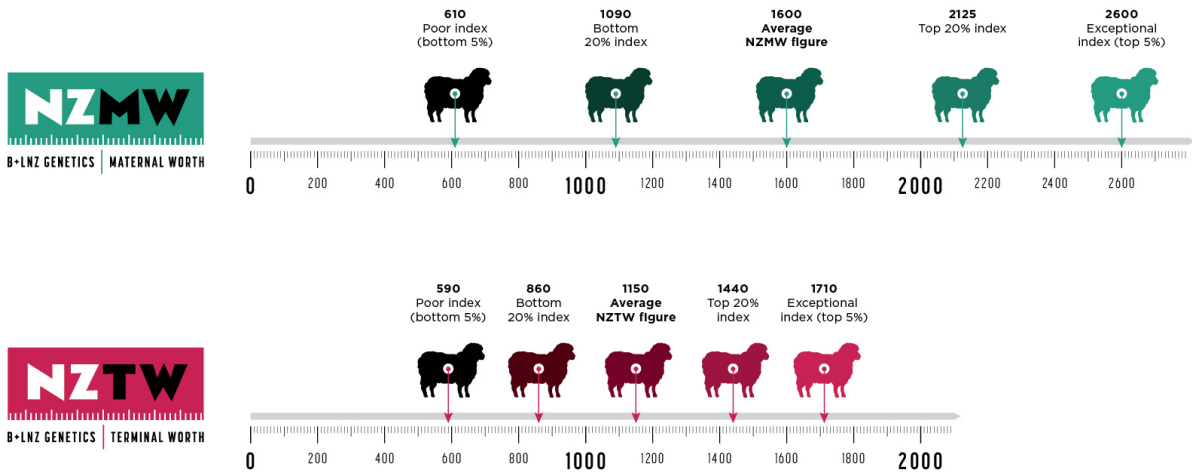
Flock Code	Flock Prefix	CountOfRams	AvgOfNZMW	AvgOfMW+M	AvgOf* DPCR	Rank DPCR	AvgOf* DPS	Rank DPS	AvgOfDPA+G	Rank DPA+G	AvgOf* DPW	Rank DPW	AvgOf* DPM	Rank DPM	Genetic Vision	Lambs 2017
1303	Snowdon	2	3570	3768	740	10%	1112	5%	1353	20%	366	20%	198	40%	Perendale	1000>3000
719	Blackdale	2	3353	3634	408	40%	667	20%	2046	5%	233	40%	281	30%	Coopworth	<500
4669	Blackdale Textra	10	3489	3609	294	50%	508	30%	2275	5%	244	40%	288	30%	Composite	1000>3000
4474	Twin Farm TEFRom	27	3325	3602	635	20%	463	30%	2110	5%	94	70%	300	20%	TEFRom	1000>3000
2629	Nithdale	3	3352	3538	719	20%	581	20%	1661	5%	391	20%	186	40%	Romney	1000>3000
4479	Rosedale Growbulk	2	3563	3517	836	10%	874	5%	1541	10%	4	90%	263	30%	Growbulk	1000>3000
124	Moutere Downs	3	3087	3408	704	20%	627	20%	1495	10%	261	40%	295	20%	Romney	<500
391	Hinenui	5	3534	3381	731	20%	931	5%	1436	20%	268	30%	15	70%	Coopworth	>3000
33	Waimai	1	3283	3379	642	20%	1072	5%	1200	30%	369	20%	96	50%	Romney	1000>3000
3855	FG Freestone	3	3229	3327	761	10%	747	10%	1356	20%	364	20%	26	60%	Romney	1000>3000
916	Longdowns	3	2894	3310	116	70%	277	50%	2198	5%	211	50%	510	5%	Composite	1000>3000
3422	Blackdale Coop Texel	4	3157	3303	488	30%	459	30%	1930	5%	281	30%	147	50%	CoopTex	500>1000
1139	Ashgrove	2	2991	3293	858	10%	772	10%	1021	40%	341	20%	122	50%	Coopworth	500>1000
233	Tamlet	2	3461	3293	583	20%	471	30%	1760	5%	265	40%	215	40%	Composite	500>1000
3001	FG Goudies	41	3235	3270	772	10%	694	10%	1510	10%	259	40%	-70	80%	Romney	>3000
259	Rawahi	18	3077	3261	656	20%	756	10%	1278	20%	318	30%	214	40%	Romney	>3000
4851	Romani	4	3326	3254	348	50%	999	5%	1398	20%	305	30%	206	40%	Coopworth	500>1000
4111	Brookfield	1	3317	3227	768	10%	819	5%	1551	10%	178	60%	-90	80%	Romney	1000>3000
712	Marlow	3	2826	3222	711	20%	811	5%	1209	30%	398	10%	-57	80%	Coopworth	500>1000
2744	Kelso Maternal	11	3153	3200	504	30%	559	20%	1707	5%	231	40%	199	40%	Kelso Maternal	1000>3000
4591	FG Waipuna	5	3246	3174	517	30%	617	20%	1642	10%	469	5%	-72	80%	Highlander	1000>3000
5000	Greeline Peter	3	2931	3168	603	20%	414	40%	1662	5%	163	60%	326	20%	Greeline	500>1000
2602	Hazeldale	5	3085	3115	472	30%	675	20%	1488	10%	350	20%	130	50%	Perendale	1000>3000
2749	Mount Linton	5	2988	3090	489	30%	524	30%	1577	10%	193	50%	308	20%	Texel Romney	1000>3000
4797	Kaahu	3	3000	3078	661	20%	482	30%	1431	20%	425	10%	78	60%	Composite	500>1000
2	Mount Guardian	3	3034	3071	594	20%	529	30%	1467	20%	352	20%	129	50%	Perendale	1000>3000

2881	Kinrae TEFRom	1	2996	3067	425	40%	265	50%	2182	5%	124	70%	72	60%	TEFRom	500>1000
2638	Woodlands Res	2	2923	3051	968	5%	572	20%	1159	30%	226	40%	29	60%	Composite	1000>3000
357	Wairima	2	2890	3032	572	30%	939	5%	1039	40%	340	20%	79	60%	Romney	1000>3000
1135	Gowan Braes	2	3047	3004	289	50%	648	20%	1519	10%	358	20%	191	40%	Perendale	500>1000
255	Paki-iti	1	3211	2984	530	30%	936	5%	1429	20%	316	30%	-227	90%	Romney	1000>3000
Flock Code	Flock Prefix	CountOfRams	AvgOfNZMW	AvgOfMW+M	AvgOf* DPCR	Rank DPCR	AvgOf* DPS	Rank DPS	AvgOfDPA+G	Rank DPA+G	AvgOf* DPW	Rank DPW	AvgOf* DPM	Rank DPM	Genetic Vision	Lambs 2017
3838	Minda Hills	4	2972	2981	372	50%	914	5%	1478	20%	160	60%	57	60%	Perendale Cross	>3000
1072	Newhaven	3	2997	2967	560	30%	436	30%	1625	10%	376	20%	-30	70%	Perendale	1000>3000
1983	Awakiki	1		2943	605	20%	1356	5%	572	80%	9	90%	401	20%	Perendale	500>1000
403	Puketauru	3	2981	2933	622	20%	405	40%	1637	10%	249	40%	21	70%	Coopworth	1000>3000
1138	Tamlet	2		2929	484	30%	353	40%	1648	10%	214	50%	231	30%	Composite	500>1000
1425	Nikau	4	3019	2915	588	20%	680	10%	1528	10%	222	40%	-129	90%	Coopworth	500>1000
4631	FG Pohuetai	5	2903	2888	665	20%	592	20%	1564	10%	82	80%	-25	70%	Highlander	1000>3000
964	Ngaio Glen	1		2888	866	5%	753	10%	1046	40%	101	70%	123	50%	Romney	1000>3000
4808	Hollycombe	1		2881	327	50%	512	30%	1725	5%	84	80%	234	30%	Romney	1000>3000
395	Makaretu	1	2974	2879	827	10%	490	30%	940	50%	716	5%	-94	80%	Romney	500>1000
4309	Fairlea	1		2879	-63	90%	788	10%	1535	10%	95	70%	523	5%	Texel	500>1000
1446	Rangiatea	2	2848	2875	149	70%	669	20%	1744	5%	286	30%	27	60%	Perendale	1000>3000
4004	Aoghaire	1		2873	635	20%	676	20%	1254	30%	67	80%	240	30%	Romney	500>1000
689	tumeke	2	2933	2872	659	20%	375	40%	1583	10%	316	30%	-116	80%	Coopworth	500>1000
4774	Ashton Glen	3	3076	2870	277	60%	435	30%	1813	5%	403	10%	234	30%	Coopworth	<500
2239	Hautere	1		2852	581	30%	615	20%	1167	30%	350	20%	139	50%	Perendale	1000>3000
1941	Raupuha	1		2839	601	20%	341	40%	1512	10%	271	30%	114	50%	Perendale	1000>3000
539	Wairere	1		2806	566	30%	803	5%	1048	40%	164	60%	226	30%	Romney	>3000
39	Turanganui	10	3070		486	30%	770	10%	1449	20%	365	20%			Romney	>3000
1177	Hinerua	1	2945		587	20%	625	20%	1502	10%	231	40%			Perendale	<500
102	St Leger	3	2896		525	30%	460	30%	1501	10%	410	10%			Romney	>3000
418	Gleniti	1	2806		407	40%	637	20%	1458	20%	304	30%			Romney	1000>3000

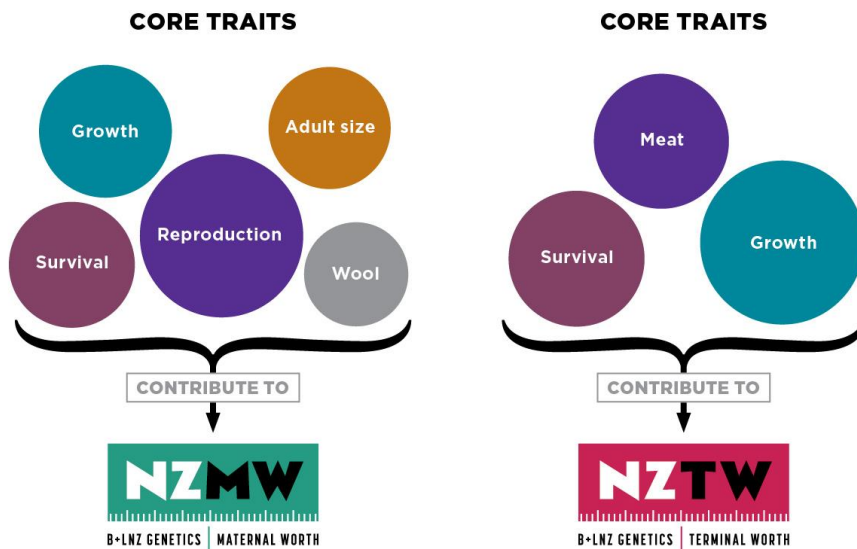
Appendix 2 – Ram Selection

Source: Better sheep breeding – Ram buying decisions, www.blznzgenetics.com

Dual purpose rams have a “Maternal Worth” figure (NZMW). The average NZMW is 1600.
Terminal rams have a “Terminal Worth” figure (NZTW). The average NZTW is 1150.



Which traits feed into NZMW and NZTW?



MAKE A GENETIC PLAN

Selecting maternal rams

		Now	Goal
Reproduction	What is your current scanning % (lambs present including triplets/ewe mated) <i>Benchmark 180% Easier, 165% Harder country</i>		
Survival	What % of lambs survive to weaning (wean %/scan %) <i>Benchmark 80% Easier, 80% Harder country</i>		
Growth	What % of your lambs do you finish to slaughter <i>Benchmark 100% Easier, 50% Harder country</i>		
	What is your average carcass weight <i>Benchmark 19 kg Easier, 17 kg Harder country</i>		
	What is your average dressing (carcass weight/kill weight = dressing%) <i>Benchmark 43% Easier, 43% Harder country</i> – note this is different to meat yield considered elsewhere		
	What is your average wean weight <i>Benchmark @ 90 days 30 kg Easier, 25 kg Harder country</i>		
	What % achieve kill weight at weaning <i>Benchmark 25% Easier, 10% Harder country</i>		
Adult size	What do your ewes weigh in prime (BCS=3) condition? <i>Benchmark 70 kg Easier, 65 kg Harder country—note lambs from bigger ewes can reach kill weights earlier but these ewes cost more to maintain over the year.</i>		
Wool	Is wool weight important for your flock?— note fine wool has different indexes than traditional strong wool. Ask your breeder if you have special requirements		

Selecting terminal rams

		Now	Goal
Survival	What % of lambs survive to weaning (lambs present/ewe mated, wean %/scan % <i>Benchmark 90% Easier, 80% Harder country</i>)		
Growth	What % of your lambs do you finish to slaughter <i>Benchmark 100% Easier, 70% Harder country</i>		
	What is your average carcass weight <i>Benchmark 19 kg Easier, 17 kg Harder country</i>		
	What is your average dressing (carcass weight/kill weight = dressing%) <i>Benchmark 43% Easier, 43% Harder country</i> – note this is different to meat yield considered elsewhere		
	What is your average wean weight <i>Benchmark @ 90 days: 30 kg Easier, 25 kg Harder country</i>		
	What % achieve kill weight at weaning <i>Benchmark 25% Easier, 10% Harder country</i>		
Meat	What % of your lambs qualify for a yield premium?		