Contents

Budgeted and forecast profit

Year ending May 31	2011 -12 Actual	2012/13 Budget	Forecast to end May	Variance
Milk production (kgMS)	297740	315075	300000	(actual -
160ha	1,861/ha	1,969/ha	1,875/ha	budget)
Peak Cow Nos and Prod.	630cows	630cows	630cows	
Staff	3.7 FTE's	170cows/FTE		
Income				
Milksolid Payout	$6.08/kgms	$5.50/kgms	$5.80/kgms	$0.30
Dividend /share	$0.22/share	$0.33/share	$0.32/share	-$0.01
Milksolid Revenue	$1,810,259	$1,732,912	$1,740,000	$7,088
Dividend	$65,503	$103,975	$96,000	-$7,975
Surplus dairy stock	$152,415	$139,031	$182,338	$43,307
Total income	$2,028,177	$1,975,917	$2,018,338	$42,421
Stock Purchases	$22,400	$21,600	25740	
Gross Farm Revenue	**$2,005,777**	**$1,954,317**	**$1,992,598**	**$38,281**

	Expenses	Actual 2011/12	2012/13 Budget	Forecast to end May	Variance	
Cow Costs	Animal Health	$59,775	$62,456	$60,559	-$1,897	
	Breeding Expenses	$53,895	$41,896	$50,905	$9,009	1
	Replacement grazing & meal	$173,982	$169,699	$140,524	-$29,175	2
	Winter grazing - Herd +freight	$123,295	$122,920	$131,267	$8,347	3
Feed	Grass silage purchased	$69,720	$86,800	$93,492	$6,692	4
	Silage making & delivery	$11,902	$12,480	$9,087	-$3,393	
	EcoN & Gibberellic Acid	$74,620	$60,240	$63,900	$3,660	
	Nitrogen	$112,916	$107,740	$115,822	$8,082	5
	Fertiliser & Lime	$43,405	$37,670	$33,248	-$4,422	
	Irrigation - All Costs	$49,041	$64,596	$73,467	$8,871	6
	Regrassing	$29,449	$29,688	$14,790	-$14,898	7
Staff	Employment	$205,593	$241,341	$217,663	-$23,678	8
Land	Electricity-farm	$23,397	$23,500	$26,283	$2,783	
	Administration	$19,315	$24,690	$20,716	-$3,974	
	Freight & Cartage	$0	$802	$580	-$222	
	Rates & Insurance	$19,020	$21,020	$21,020	$0	
	Repairs & Maintenance	$61,936	$54,493	$54,200	-$293	
	Shed Expenses excld power	$11,091	$11,848	$8,500	-$3,348	
	Vehicle Expenses	$22,371	$23,546	$31,920	$8,374	9
	Weed & Pest	$972	$500	$1,340	$840	
Cash Farm Working Expenses		**$1,165,695**	**$1,197,925**	**$1,169,283**	-$28,642	
		$3.92	**$3.80**	**$3.90**		
Depreciation est		$105,000	$116,000	$116,000		
Total Operating Expenses		$1,270,695	$1,313,925	$1,285,283		
Dairy Operating Profit		**$735,082**	**$640,392**	**$707,315**		
DOP		**4,594/ha**	**4,002/ha**	**4,421/ha**		
Cash Operating Surplus		**$840,082**	**$756,392**	**$823,315**		
		$5,251 / ha	**$4,727 / ha**	**$5,146 / ha**		

Actual Expenses without eco-n autumn 2013		
	Total FWE	$1,116,483
	FWE	$3.72/kgms
	Dairy Operating Profit	$4,751 / ha
		$760,115

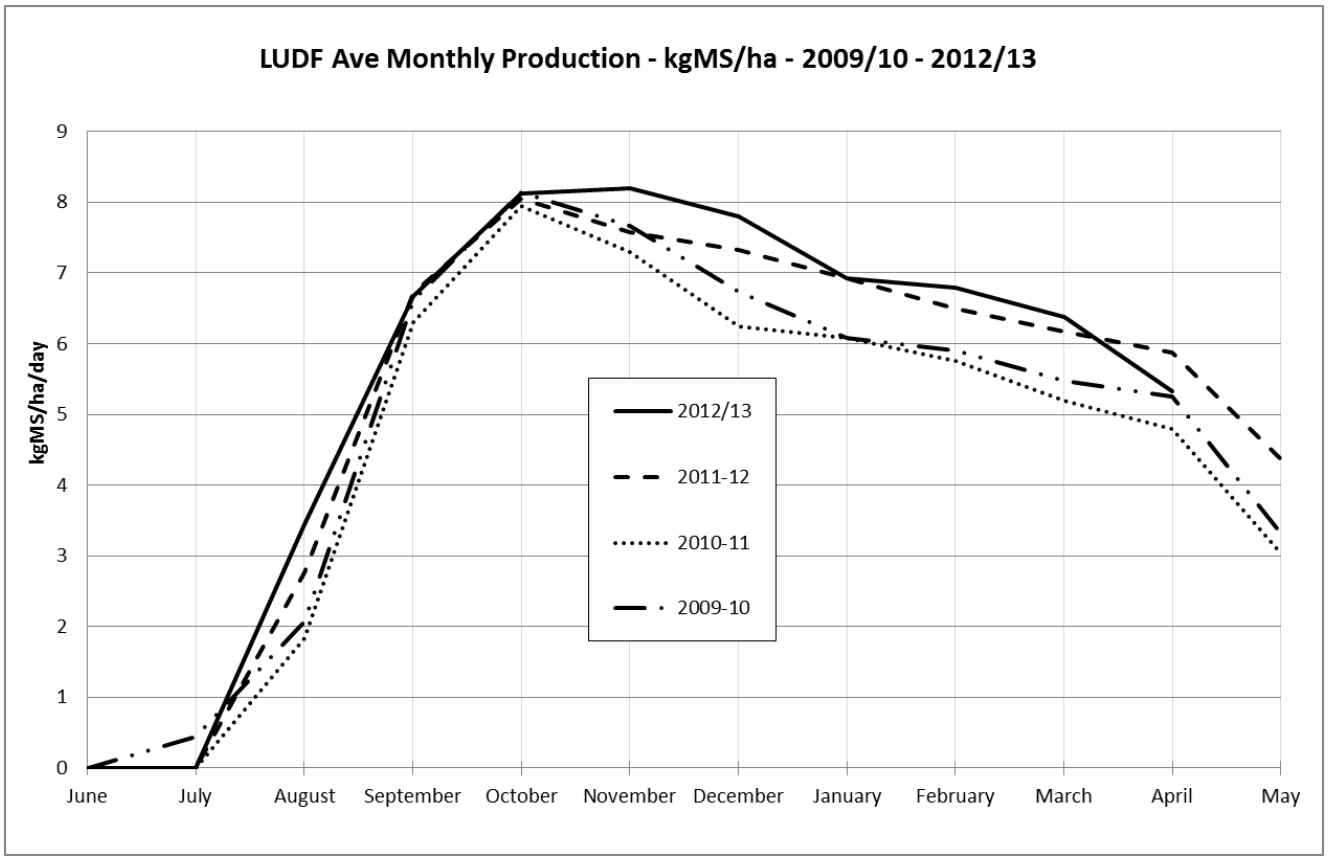
Budget over-runs:

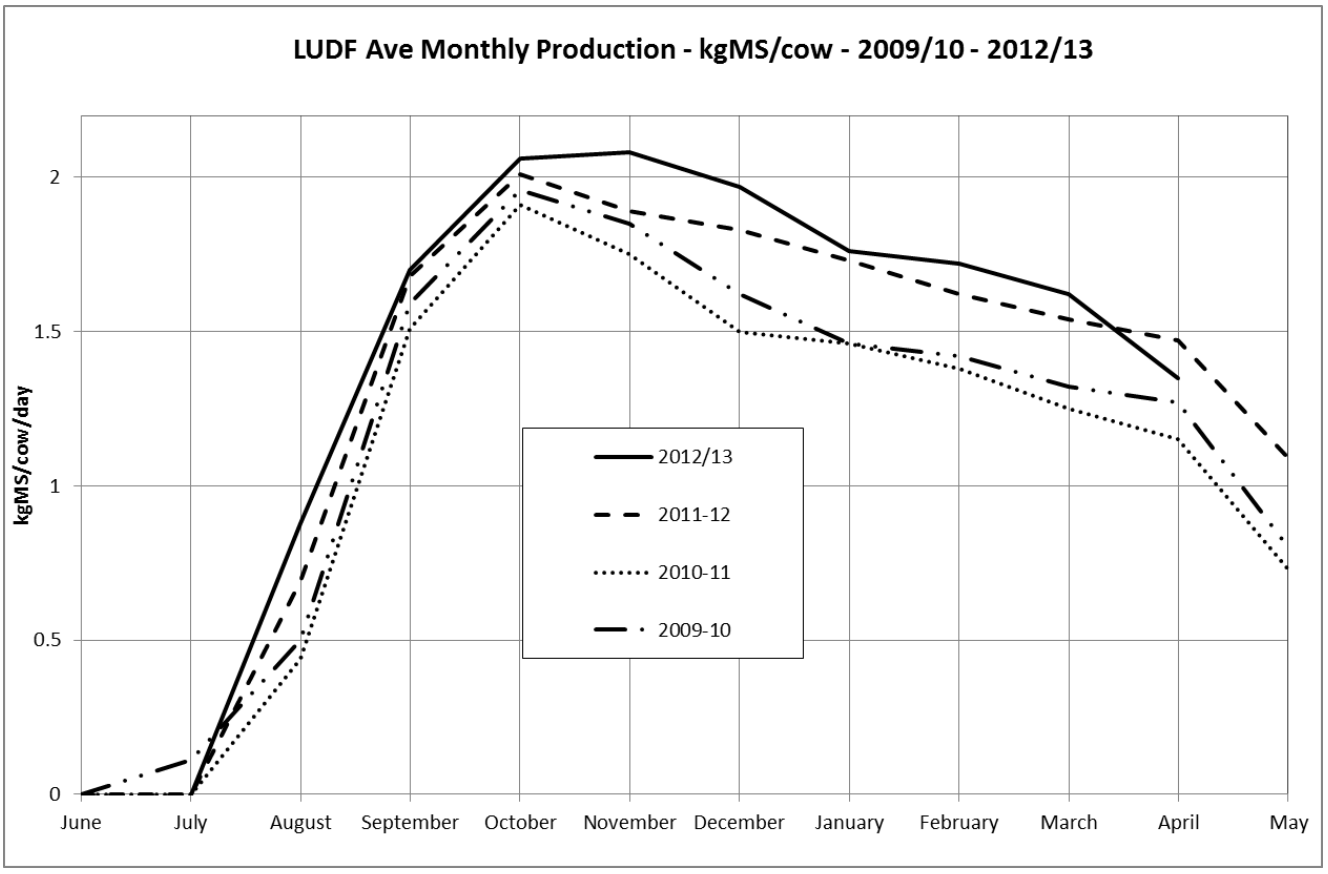
1. **Breeding costs** - this has occurred over a number of areas including the unbudgeted use of K-mars for the second round of mating. Also extra BVD tests for surplus calves, extra DNA tests and the herd was metro checked twice as part of endeavouring to get more cows in calf.
3. **Winter Grazing** - due to the higher than budgeted costs we are having to pay this autumn for our lighter condition cows dried off early
4. **Silage purchased** - a slightly higher purchase price than budgeted
5. **Nitrogen -** have used slightly more than we budgeted for and has cost us more to apply than we budgeted
6. **Irrigation -** has cost more this season due to irrigating more days than budgeted due to the hotter / drier summer thus increasing power use
9. **Vehicle Expenses** - higher due to more diesel used than budgeted due to more mowing which has also had an impact on more tractor maintenance

Savings to date:

2. **Replacement Grazing** a big part of the under spend is because our calves did not go out to contract grazing until late February and also we have cut the number of 2 year olds back to 119 or 18%
7. **Regrassing** is below budget because we budgeted to regrass 3 paddocks but have only done 2 this season
8. **Employment** – as reported earlier in the season, delayed start for one staff member and little use of casual staff.

Milk Production this Season:

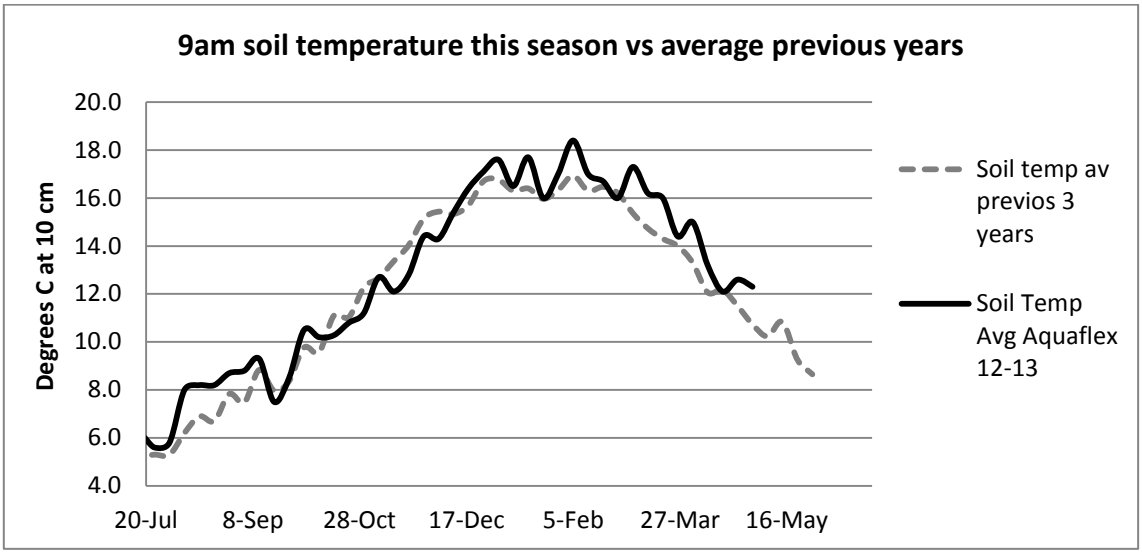




LUDF Season Review

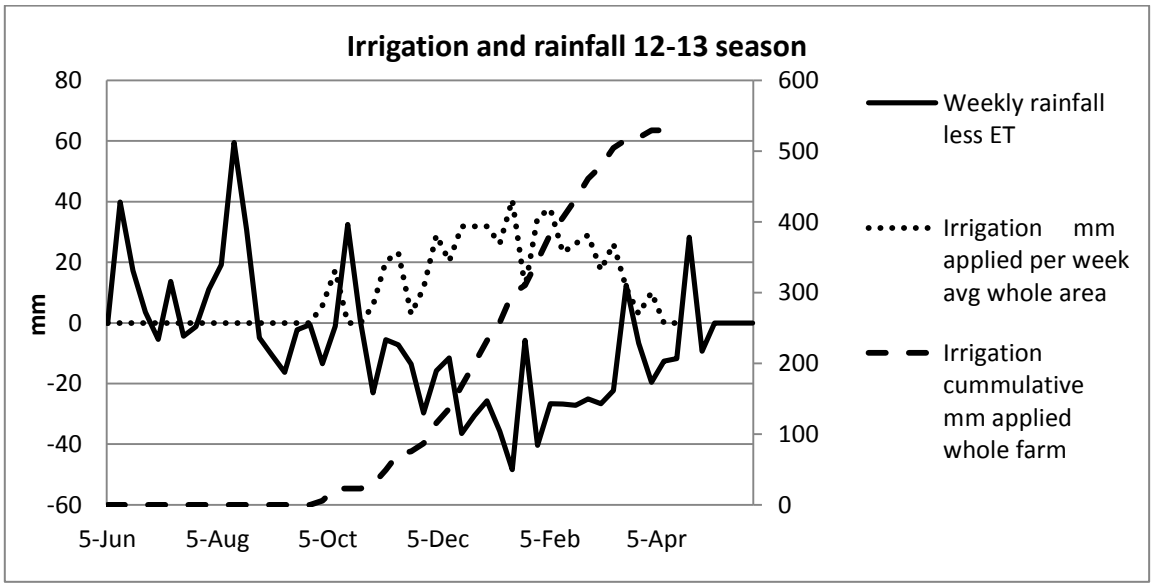
Growing Conditions

We have had a mild autumn to date with good growing conditions after a very mixed spring and summer. Key challenges along the way were a warm but very wet August followed by a cool spring which forced us to feed a lot of silage. Hot temperatures in mid-summer appear to be the cause of low pasture growth rates and very low pasture energy levels.

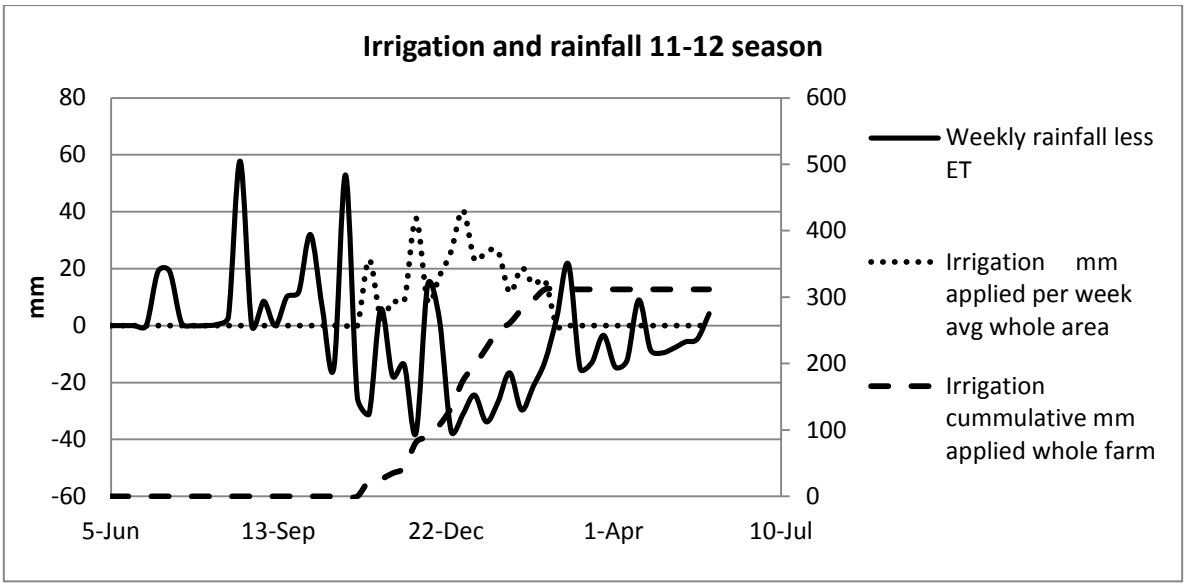


Irrigation and rainfall

Irrigation ran fairly consistently through the whole irrigation season from early October to mid-March. Just over 500mm was applied, which is about average. LUDF has a reliable irrigation system with comparatively high capacity, however, at times this season the system struggled to keep up, with dry patches apparent on the lighter soils during mid-summer when temperatures [and evapo-transpiration] were unseasonably high.

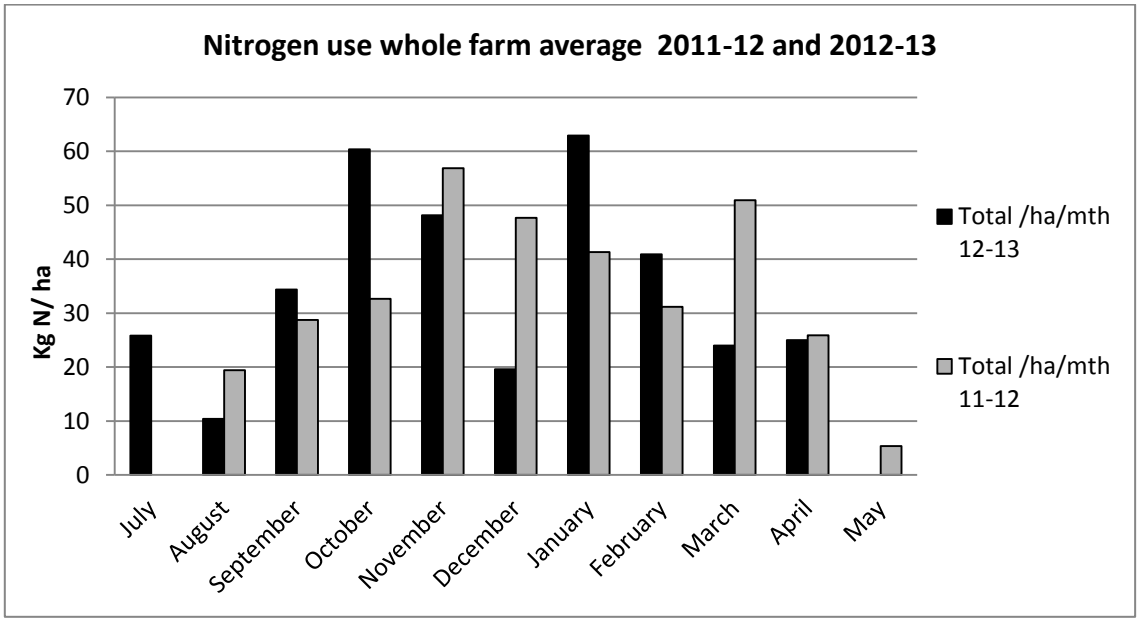


Compare this to last season [see below] where irrigation started later and finished earlier. Total water applied was only 311 mm/ha in 2011/12.



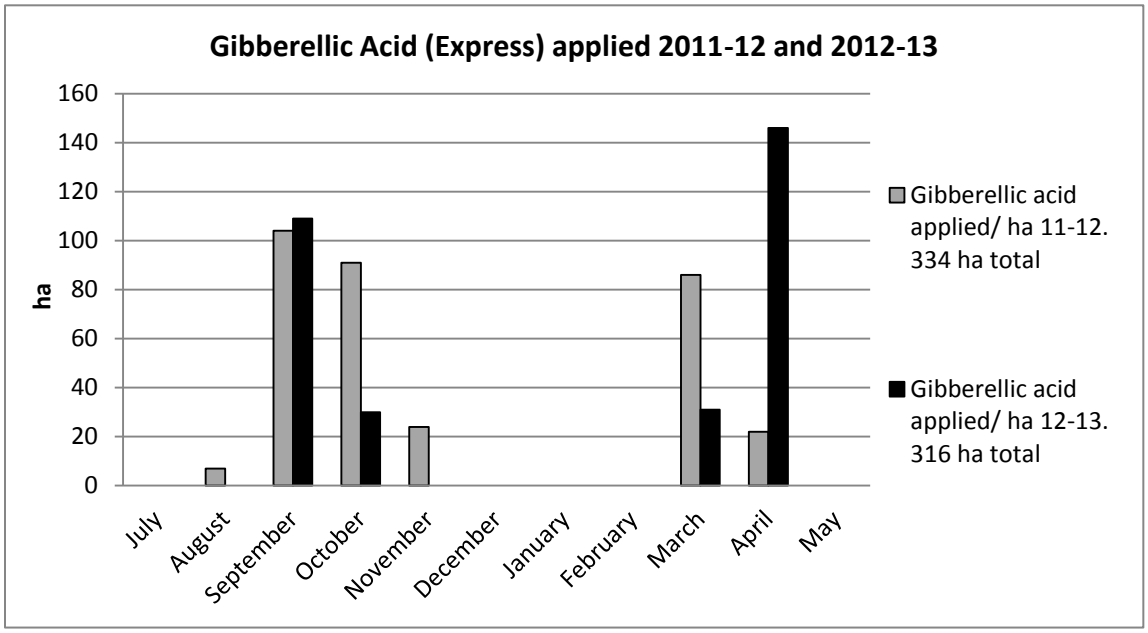
Nitrogen Use

N use has happened a little earlier this season, particularly the application of ammonium sulphate in late July as ground and growing conditions indicated it was feasible. Total N was 351kg N /ha 2012-13 vs 340kg N/ha 2011-12. The farm stopped N earlier this season and reduced rates in the autumn compared to last season.



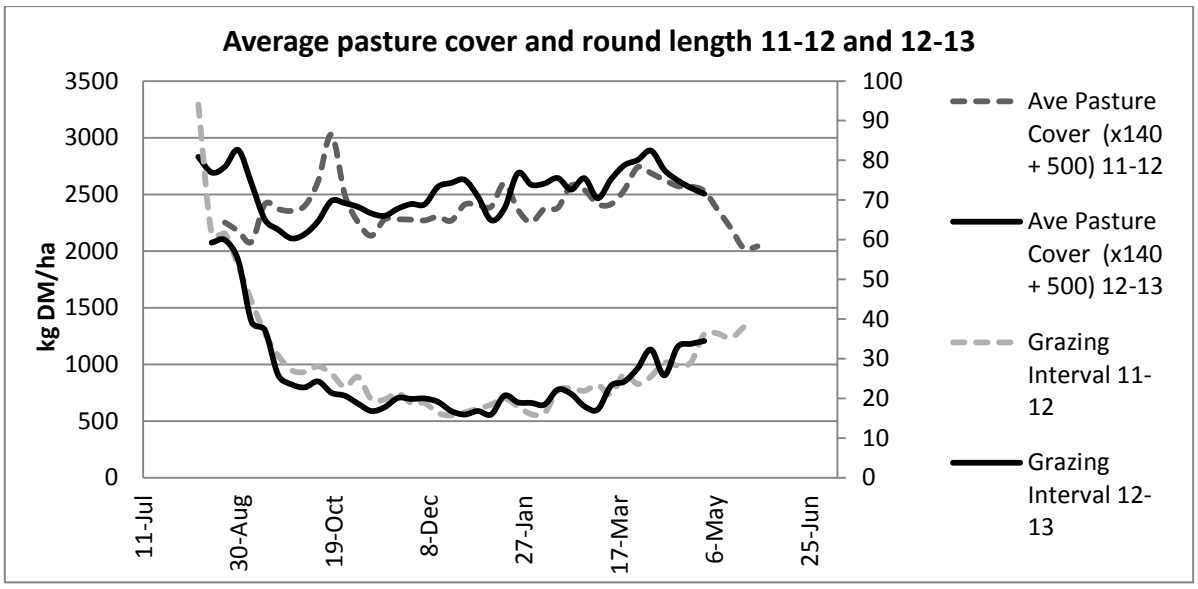
Gibberellic Acid

We have finished using GA this year [as at 1 May] with a total of 316 ha vs 334 ha in 11-12. Slightly more used this season in the autumn. We estimate that cows eat around 300kg DM per application which is very good value at about 12c kg DM. This has been very valuable on the shoulders of the season and combines well with [and is much cheaper than] pasture silage. It also aids with uptake of soil nitrogen – through the higher growth rates.

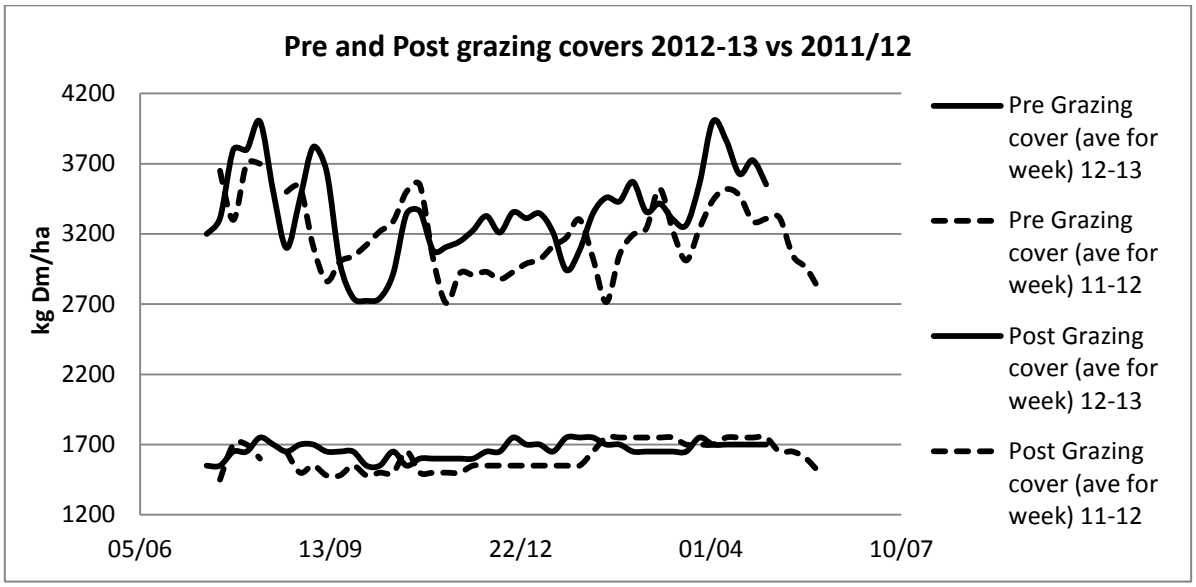


Pasture management

The grazing round length has been broadly the same as last season except during times of deficit. Average pasture covers were high in the spring due to very warm wet conditions making efficient grazing impossible, they dipped rapidly in the cool September/October period and then slowly increased as we sought to maintain round length, optimum pasture leaf stage at grazing and cow intake.

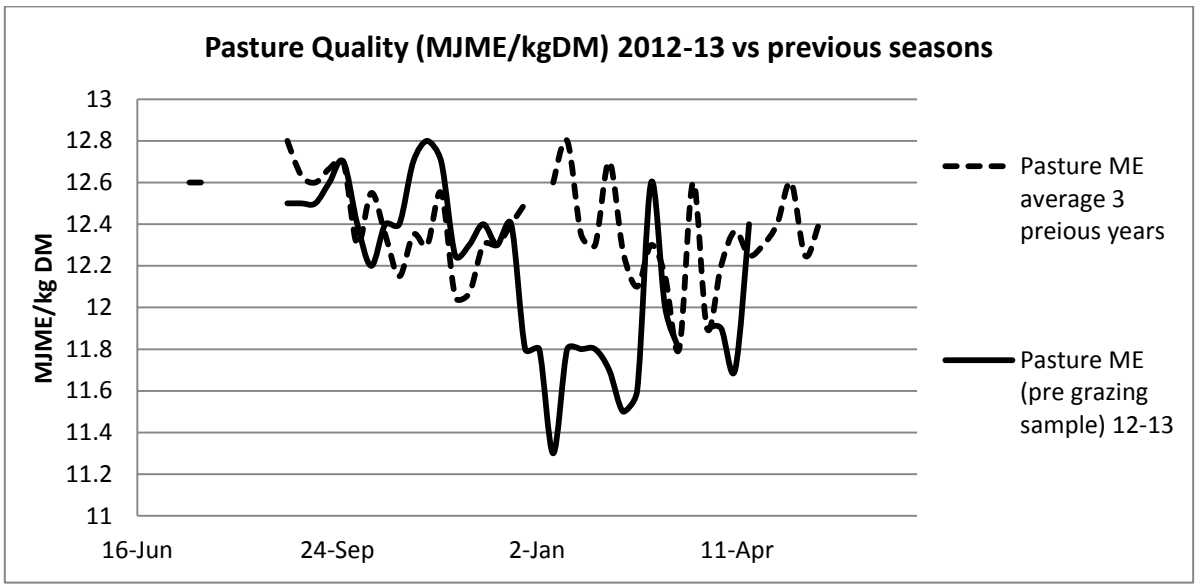


The main issue with pre grazing covers this season has been the relatively high covers in the summer and autumn. Some of the higher measured covers may be due to the stemy nature of the pasture in summer. The hot temperatures appeared to drive an extended heading period and consequent "holding up" of the plate meter. Pasture residuals have been carefully managed inside the 7 -9 click range [1480 – 1760 kg DM/ha] as per the farm's management plan. We did expect to get them a bit shorter in mid spring to summer but again the stemy nature of pasture this year made that impractical.



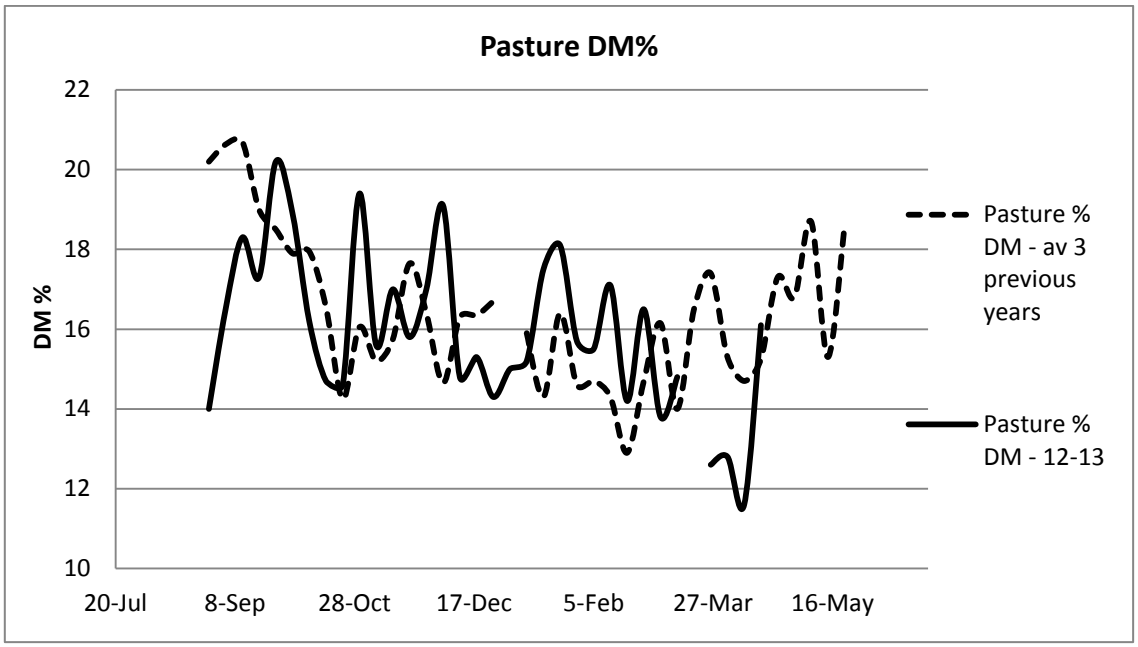
Pasture Quality

It has not been a great year for pasture quality from an ME angle. Metabolizable Energy took a step change down of about 0.5 ME units in early-mid December and has taken most of the season to recover. This been observed on other Canterbury dairy farms and is most likely a consequence of warmer than ideal conditions for ryegrass growth.



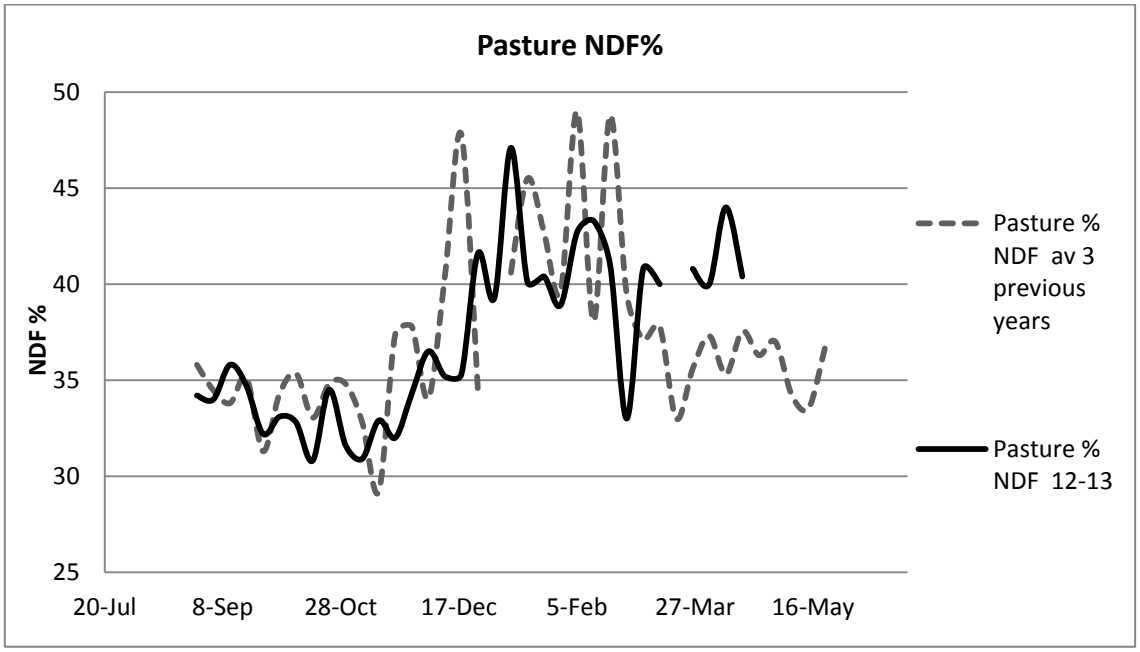
Dry Matter %

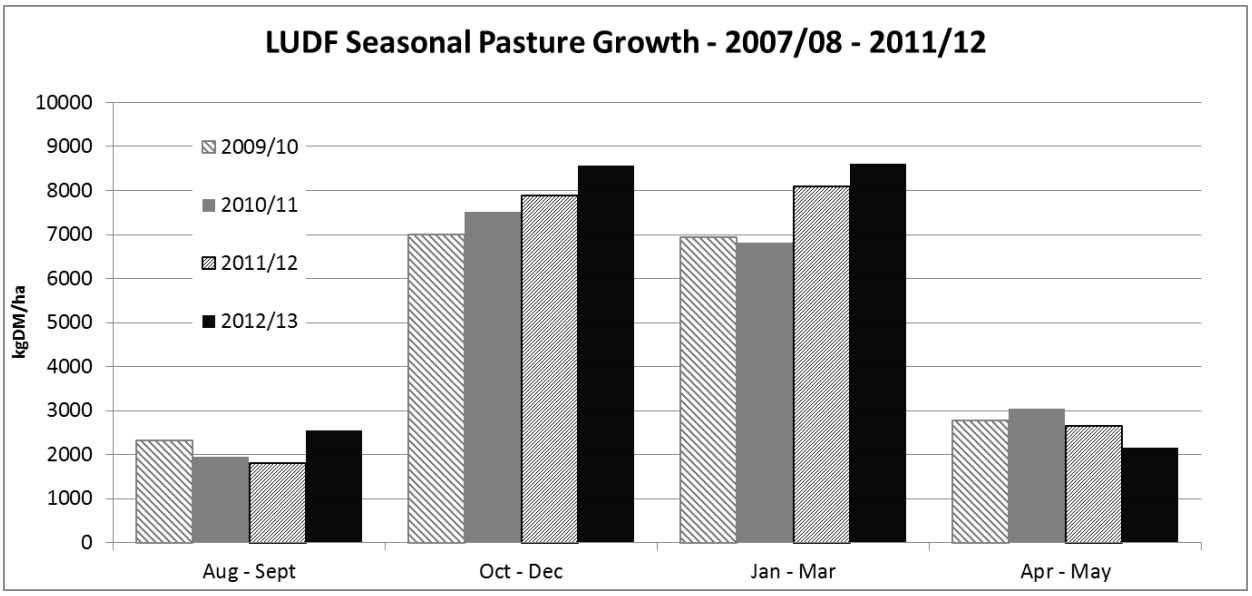
Pasture dry matter content has been similar to most years, if not perhaps a little more erratic with marked peaks and troughs throughout the season



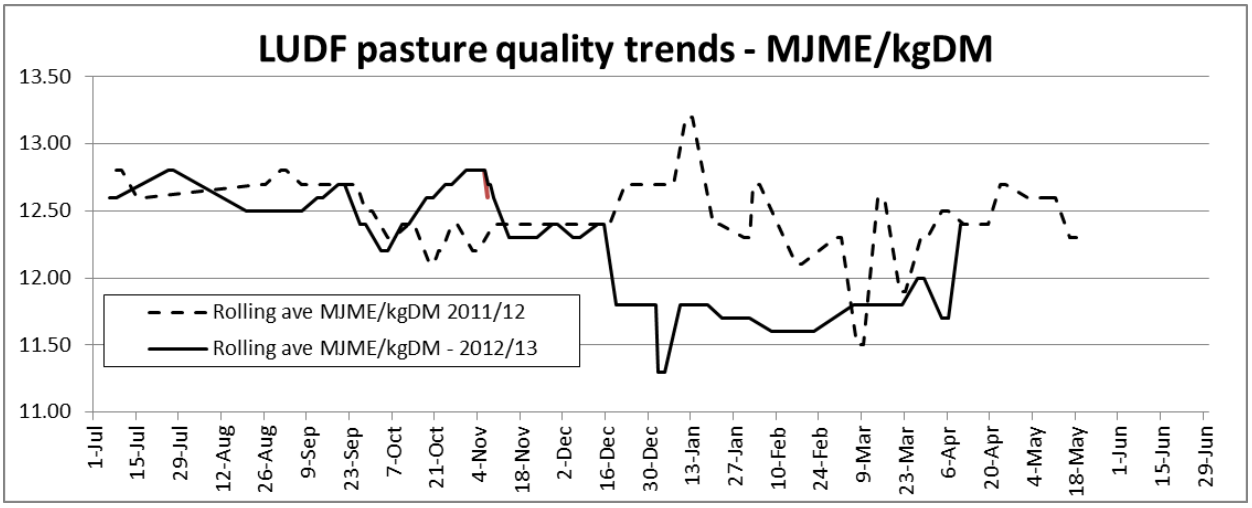
NDF %

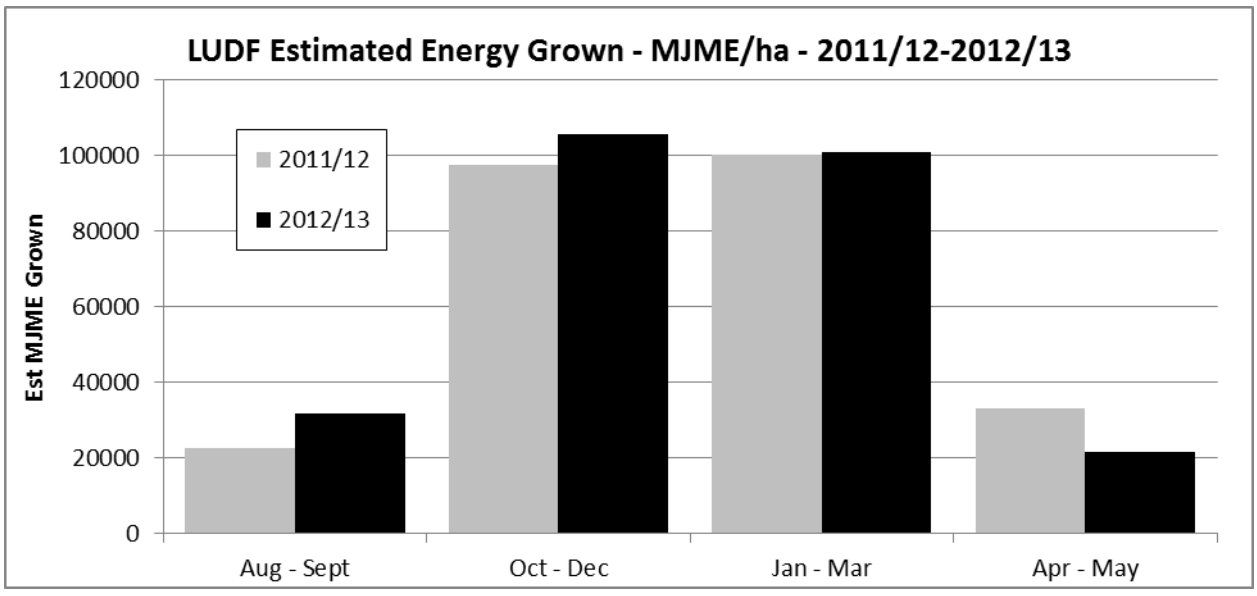
NDF has tended to be a little lower than average for most of the season which is unexpected given the stemy nature of pasture observed this year.

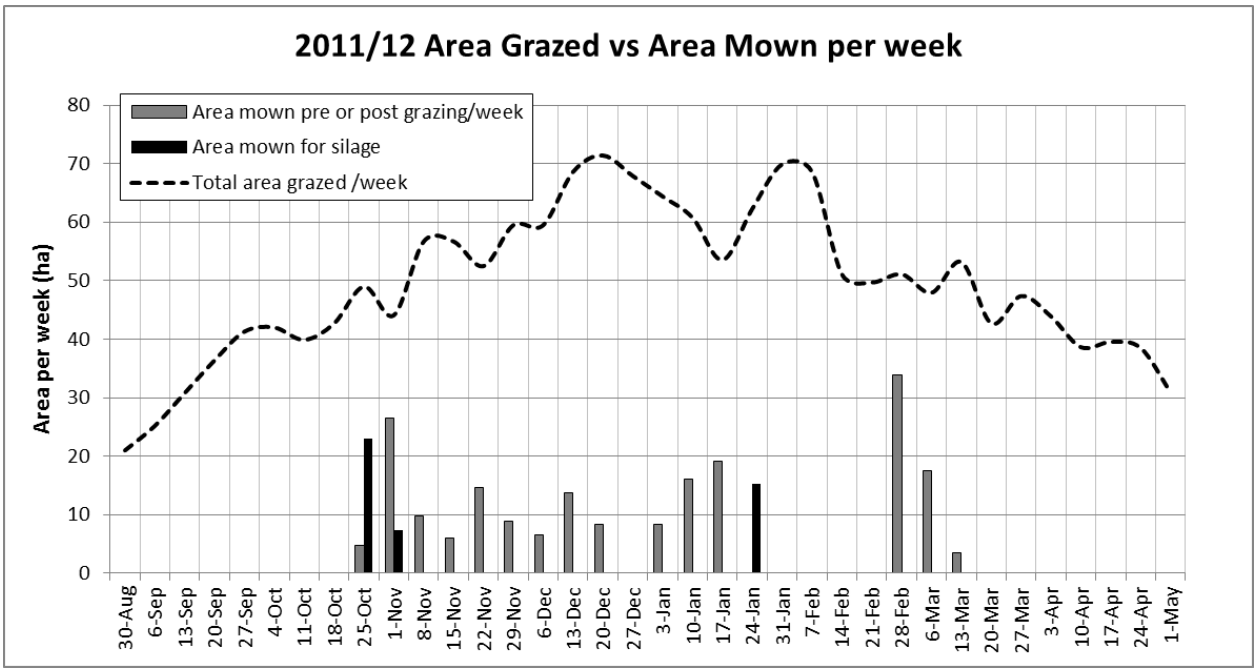


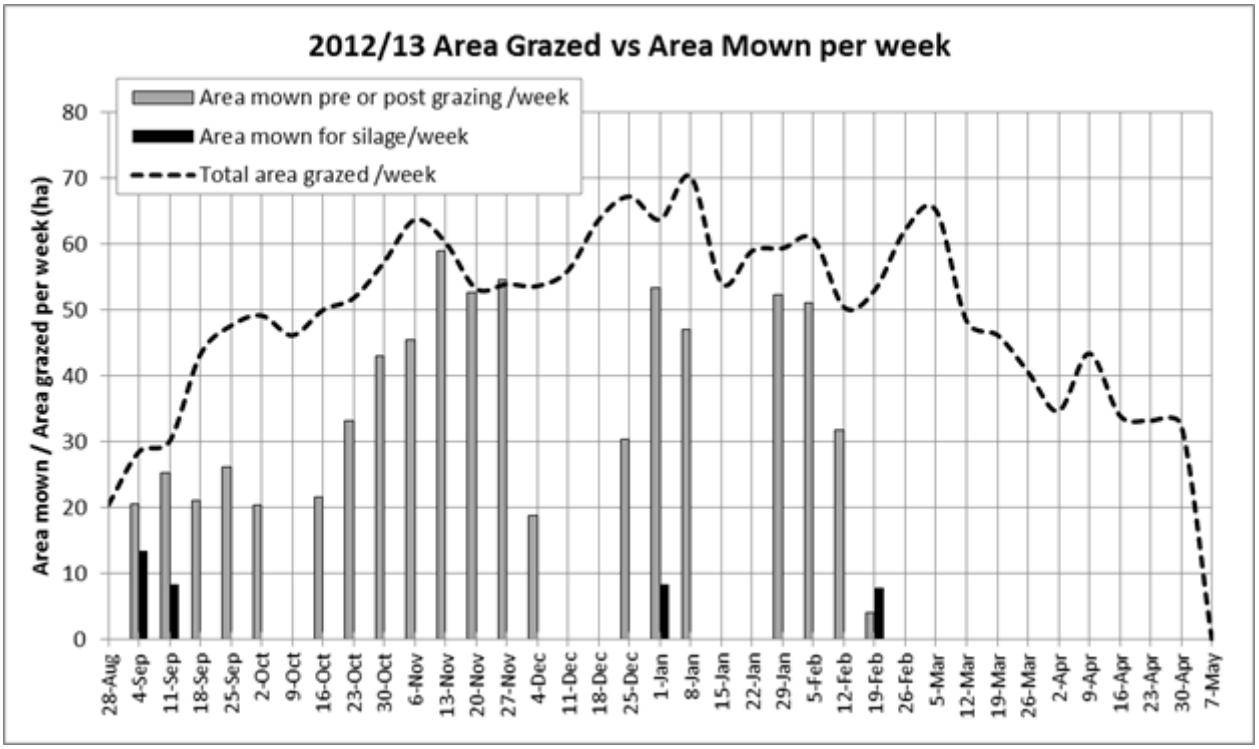


Note – April-May 2012/13 season excludes most of May. Data derived from weekly farm walk.





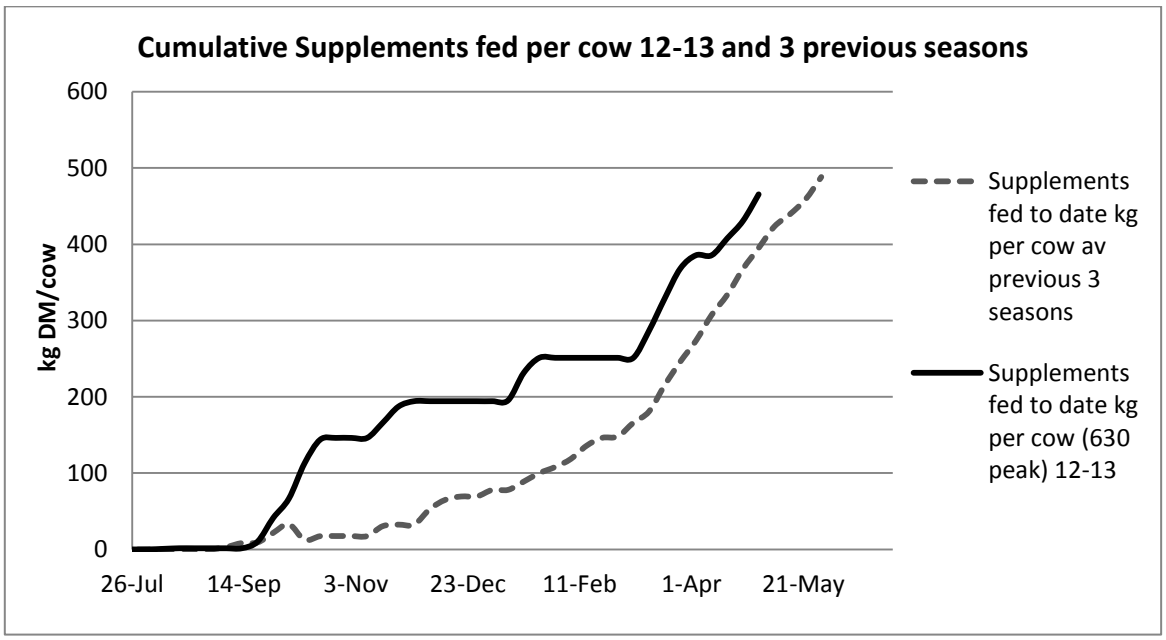


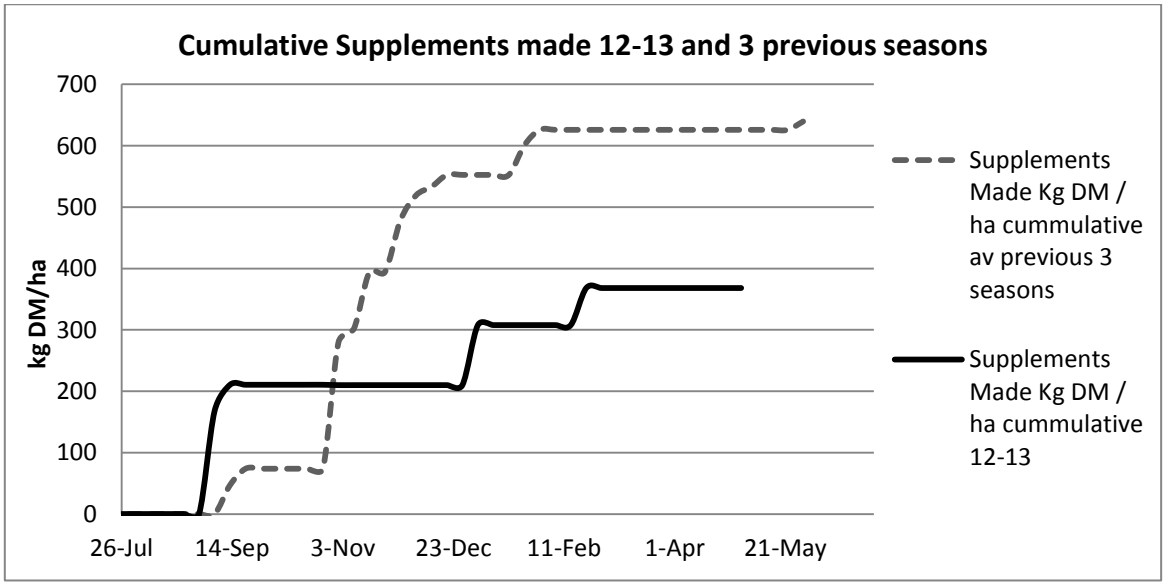


Supplements

A decision was made to stick to our budgeted silage for the season despite being 100kg/cow ahead of average for the time of year before summer had even finished. This was as a consequence of some large feed deficits in October and January.

We have made less supplements this season because cows have produced well and consequent demand has meant that few surpluses have occurred.





Herd Structure – Small Herd / Large Herd Split

Small Herd (up to 1/3 of the total cows in milk – approximately 200-210 cows).

1. **From calving to late January:**
   First calvers and lowest condition score cows. As condition scoring occurred fortnightly, the lowest condition score cows could be moved as required between herds.

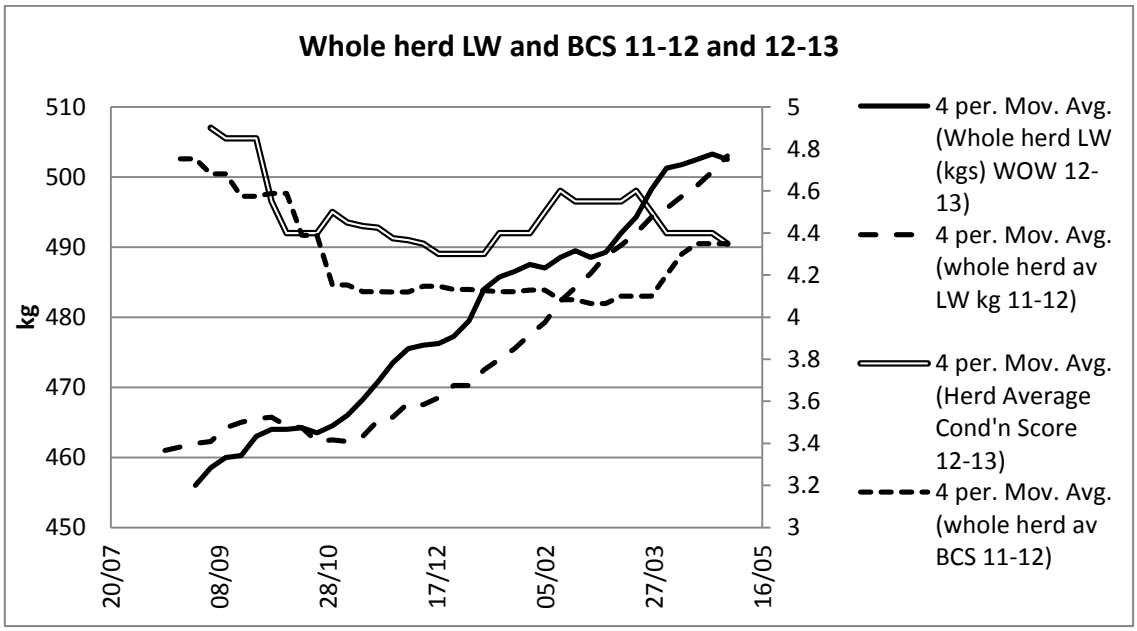
2. **From late January to beginning April:**
   Early calving, light condition score cows became the small herd.

3. **Through April:**
   The small herd makeup reversed with well-conditioned cows, empties and culls put together into the small herd. These cows largely followed the main herd; with the main herd grazing the majority of the available feed and the small herd immediately following to take paddocks down to desired grazing residuals. This allowed the main herd to be well fed, while pasture quality was maintained through the grazing pressure applied with the small herd. Milk production declined a little bit when this occurred, suggesting the new small herd was working harder to get their target intake.

4. **Late April:**
   During April, the empties and culls were sold, reducing the size of the small herd to the point that it became more practical to run only one herd by the end of April. This was aggravated by the deterioration of the race surface such that moving two herds became excessively time consuming.

Cow Liveweight and Body Condition Score

Cows have started and are finishing the season in much the same state as last season in terms of both average live weight and BCS. Through the middle of the season cows have been heavier and on average higher BCS than last season. We have used less silage this autumn and started using the second herd [of high BCS and late calvers] earlier to clean up residuals. This allowed us to concentrate on getting all cows to target whilst economically using silage and stripping a little bit of excess BCS of higher condition score cows.



We have been consistently applying our BCS dry rules, [see below]. As of 7 May 2013 we have 514 cows in milk on the platform and will continue to identify cows to dry off by condition score and calving date. At this time last season we had 581 cows in milk [and 284530 kg MS season to date], this year we have 514 cows in milk [and 289110 kg MS season to date]. We might have run more cows and made more milk at this time of the year but limits to our supplements budget and a view that fully supporting extra cows [culls] on balage is largely unprofitable.

Our drying off decision rules as presented below.

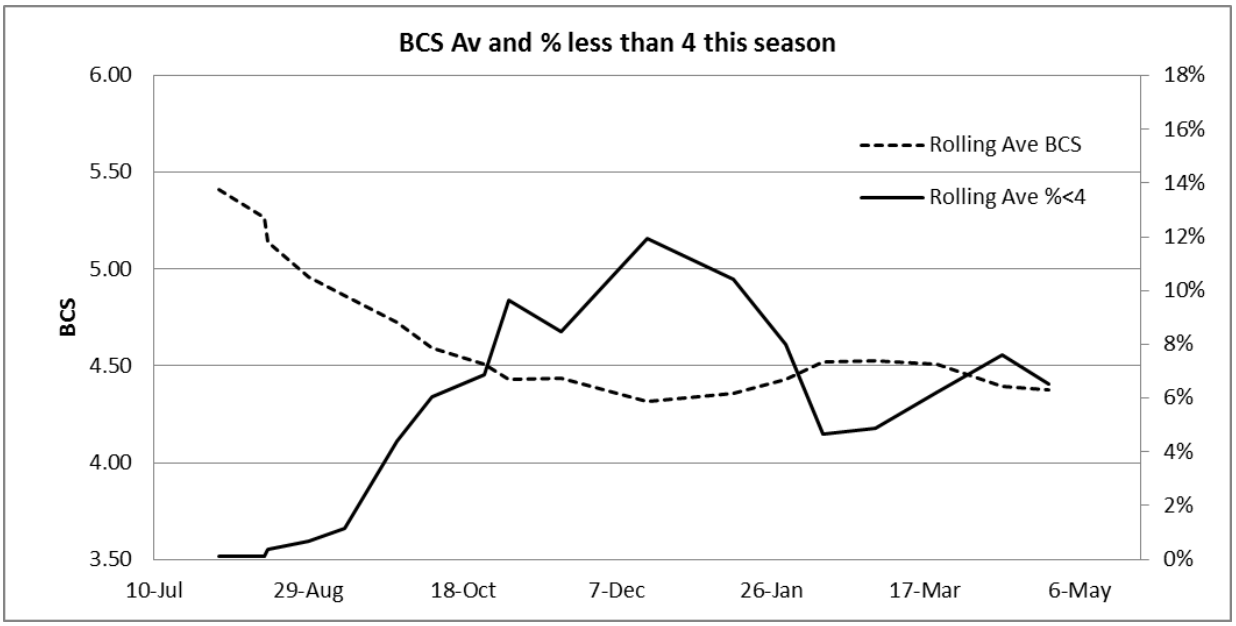
Cows (4 years old and older)

Cow Condition	Dry off time (days before Calving)	Date cow needs to be dried off (calving date 1-15 August)	Date cow needs to be dried off (calving date 15-30 August)
3.5	100	20 April – 5 May	5-15 May
4	80	10-20 May	20 -30 May
4.5	60	NA	NA

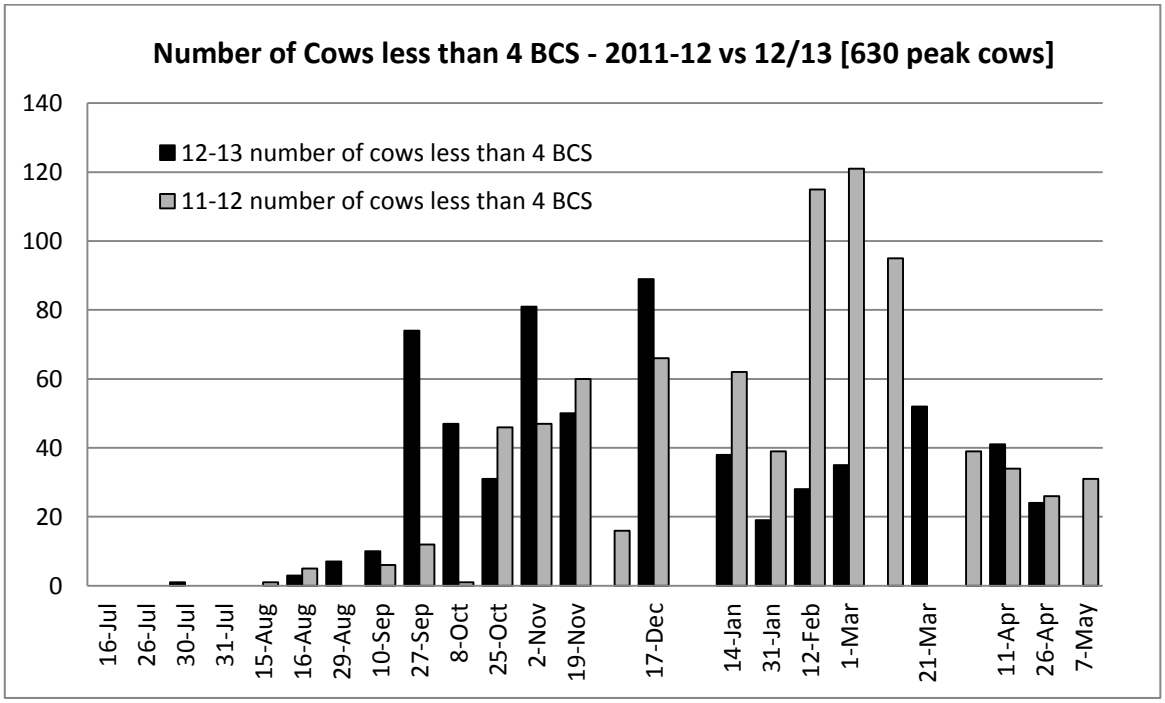
Rising 3 year Old

Cow Condition	Dry off time (days before Calving)	Date cow needs to be dried off (calving date 1-15 August)	Date cow needs to be dried off (calving date 15-30 August)
3.5	120	1-15 April	15-30 April
4	100	20 April -5 May	5-15 May
4.5	80	10-20 May	20 -30 May
5	60	NA	NA

One of our key metrics when managing cow condition across the season is the percentage of the herd [or group] with a BCS less than 4. While the average is important and interesting, it is this number and the identification of these cows which need attention. It can be seen [below] that the highest incidence of low BCS cows [about 12% this season, slightly higher than last year] comes at nadir when average BCS is also lowest. Consistent feeding, including the use of a small herd for at risk cows [particularly 1st calvers], has been successful again this year in allowing us to manage the BCS of cows we intend to keep.



This season we have had a few more low condition cows early in the season, possibly due to the need to feed more silage in spring but we have been able to reduce this number later in the season through a combination of using the second herd, and early drying off in line with our policy.



LUDF 2013 Wintering Plans

Our wintering **requirements** are based on getting all MA cows to BCS 5 by planned start of calving and all first calvers to BCS 5.5.

The decision rules for this are outlined earlier in these notes.

Currently, cows which have been dried off and will be retained for next season are on East Block, where we pay commercial grazing rates.

At drying off, all cows will be teatsealed; short acting dry cow therapy will be used on low somatic cell count cows whilst cows which have had mastitis will get long acting dry cow therapy.

After dry off the herd will be split 3 ways for wintering as follows:

1. **High BCS cows**, around 75 of the highest BCS cows [which have no or little requirement to gain condition over winter] will remain on the platform to manage pasture cover. If ground conditions dictate, these cows will be removed to grazing elsewhere in order that average pasture cover of 2500 kgDM/ha is achieved at start of calving.
2. **300 mid BCS cows** will go to Lincoln Universities Ashley Dene farm where they will winter on crop based diets. They will be managed to gain the required 0.5 BCS. This is part of the P21 research programme.
3. **Lighter MA cows and all R2s** will winter on high allowance green feed plus pasture silage. This comes at a cost but will ensure that cows return at the required BCS. Last year's cows on this treatment gained 0.7 BCS.

Currently we intend to milk all cows TAD as late as possible in May. We don't want to have to pay extra winter grazing by sending cows off platform early, however we will not compromise on BCS or the necessity not to damage soils and pasture in wet conditions.

Given the recent 64 mm of rain the farm is now wet and vulnerable to damage from more rain. Therefore we have moved to drop some pasture cover by speeding up the round and reducing silage inputs for a few days. This will leave us with more silage later in the month and should also avoid poor utilisation in the wet conditions currently. (see farm walk notes later in the hand-out for more details).

Lameness - 2012/13 Season

34% of the cows were lame (214 /630 cows)

- 133 cows were lame once
- 44 were lame twice
- 37 were lame three times or more

Which Foot

- 5% were lame on Front Left
- 7% Front Right
- 46% Back Left
- 42% Back Right
- 80 cows were lame in both back feet

What did they have?

- 72% WHITE LINE
- 2% BRUISING
- 2% INTERDIGITAL LESSION
- 7% SOLE PENETRATION
- 17% FOOTROOT

How were the cows treated?

- 214 cows were Trimmed
- 62 cows had Excenel
- 12 Cows Depocillin
- 129 Shoes fitted

Healthy Hoof Programme - Farm Visit Brief Report, 14 March 2013.

POSSIBLE CAUSES OF LAMENESS AT LUDF

Neil Chesterton, Inglewood Veterinary Services - Healthy Hoof Programme

1. All tracks have lost their top surface completely. These need resurfacing, ideally with lime fines. Lime fines will bind in well because the majority of the base material is lime chip. On the circular race rotten rock is exposed and should be rolled first to crush it before applying fines.
2. The entrance track area from NE will always be a problem area for cows to walk on because of surface damage from vehicle entry. This area should be concreted and transition material laid to reduce stones carried on by vehicles.
3. Cow flow onto platform. The narrowed down entry is good, however I recommend changing entry by moving the whole entry pipework to left closer to cups-on position. This repositioning will have three advantages a) this will move the ERD Reader also to the left and make the exit wider. b) It will create a more gentle angle for the cows to approach the bails and without a sharp turning angle at the entry. c) The cows will be closer to the milker and so easier to get to if a cow needs encouragement to keep moving to the bails.
4. Another idea to try immediately to improve cow flow at the bail entrance (before the above changes) is to move the backing gate that is parked in line with the entry bridge. Move this gate clockwise about one metre to give more standing space for those cows that stand in the way of entering cows.
5. Cow flow off the platform. On the exit area, the pipework near cups-off is too high for cows to turn easily. Lowering the top rail to 900mm near the platform and then sloping up to normal rail height will give cows more space to turn as they reverse off because the turning cow will have space for her head over the top of the bars.
6. Handling in the yard was good, handling on the track was good.

7. Foot rot – needs a footbath to regularly (2 days/week morning and night) bathe feet when cases show up. Foot rot starts with an injury between the toes that breaks the interdigital skin. Usually this is from 1cm stones or gravel along the sides of tracks, around water troughs or in gateways. Another possibility is the lime chip put on the wheel tracks of the irrigator. Build a footbath on the exit near the drain using the specifications from my website www.lamecow.co.nz

Winter Maintenance

Lane Resurfacing

As identified through cow behaviour and noted by Neil Chesterton's report, the surface of the LUDF races has deteriorated to the point it is impacting lameness on LUDF. The first 360 metre of the races either side of the cowshed will be scrapped, then recapped with lime. Outside of these areas, crusher dust will be spread in the centre of the races.

Pipework at Cups-on

The pipework directing cows at cups-on is also to be changed to help improve cow flow. This is an opportunity arisen following on from the installation of the ACR's (Automatic Cup Removers) and replacement of the fixed rails with a second backing gate.

Cowshed Platform

The I-beam under the platform has jammed on an increasing frequency this season. 3 years ago a major reweld / repair was undertaken to strengthen the beam, and regrettably this work has effectively been redone over the course of the last 3 seasons.

The existing I-beam on steel rollers is being replaced with a twin I-beam on nylon rollers. Whilst this is a significant R&M cost, it should provide much greater working life and avoid the $18-20,000 costs (plus staff time / productivity lost) incurred over the past 3 years.

Replacing this is a substantial job requiring removal of the cup removers, with a likely cost of $70-80,000. Hence a longer term solution is required.

Lincoln University Dairy Farm - Farm Walk notes

Tuesday 7th May 2013

Critical issues for the short term

1. **Monitor average pasture cover and respond to surplus or deficit.**
2. **Maintain post grazing residuals of 7 - 9 clicks.**
3. **Use back-fences on all herds whenever paddock grazing takes more than 36 hours.**
4. **Maintain round length to achieve target pasture cover at drying off.**
5. **Identify cows to dry off and or cull and get them off the platform.**
6. **Manage ground conditions.**

Herd Management

1. We have cut cow numbers by selling empties and now have 514 cows milking into the vat. The cows are now in one herd as most of our culls have gone.
2. There have been no new cases of mastitis but 19 new cases of lameness. With the wet weather our lanes are not performing well: the surfaces need recapping and cows have become reluctant to walk on them. Lame cows are being kept close to the shed and milked twice a day.
3. We will keep monitoring cow condition and continue to use our drying off decision rules as presented below.

Cows (4 years old and older)

Cow Condition	Dry off time (days before Calving)	Date cow need to be dried off (calving date 1-15 August)	Date cow need to be dried off (calving date 15-30 August)
3.5	100	20 April – 5 May	5-15 May
4	80	10-20 May	20 -30 May
4.5	60	NA	NA

Rising 3 year Old

Cow Condition	Dry off time (days before Calving)	Date cow need to be dried off (calving date 1-15 August)	Date cow need to be dried off (calving date 15-30 August)
3.5	120	1-15 April	15-30 April
4	100	20 April -5 May	5-15 May
4.5	80	10-20 May	20 -30 May
5	60	NA	NA

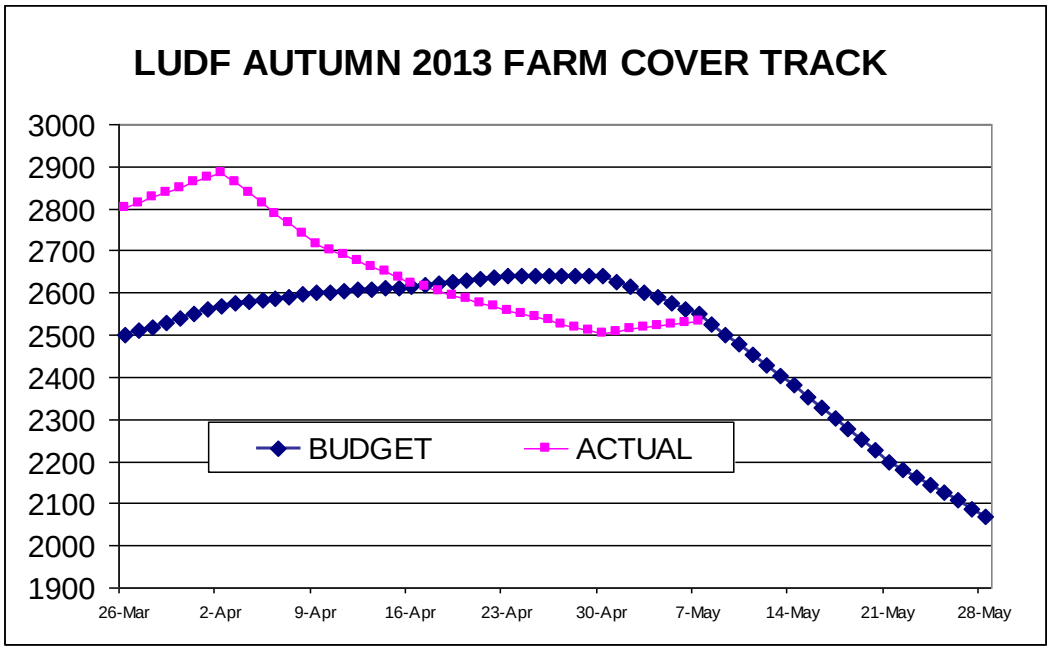
This strategy requires feeding the cows that are being dried off above demand and good quality feed.

Growing Conditions

4. Pasture growth has been 46 kg DM/ha day, down from last week's 50 kg DM/ha measured.
5. Soil temperatures at 9 am have averaged 11.1 degrees, there has been a marked fall in the last 2 days. We had 64.6 mm rain and the Aquaflex soil moisture meters indicate that soil moisture levels are 100% of field capacity. The farm is quite wet underfoot and the cows are all on the driest paddocks. So far there has only been superficial pasture damage but this will be monitored closely as we will not accept excessive pasture/soil damage and/or cows not reaching BCS targets at dry off. We will also consider standing cows off for short periods if required to protect pasture.

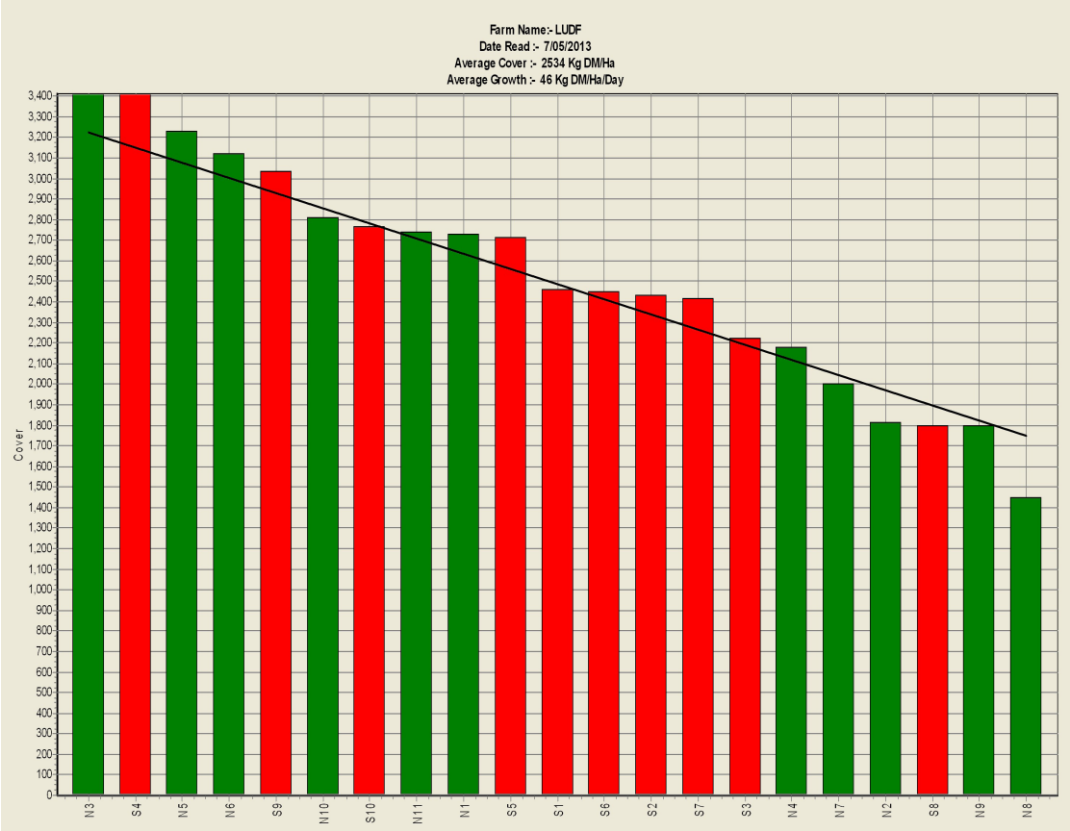
Pasture Production and Management

6. A total of 29.5 ha was grazed for a 38 day round length. 7.7 kg DM/cow/day of silage has been used. This is 2 kg per cow/day more than last week. In the short term we will stop using silage and allow the round to speed up a little to ensure that we can graze the 4 or 5 highest cover paddocks. The intention is to keep us on track with our cover and avoid poor silage utilisation with wet ground conditions.
7. Nitrogen application has now finished.
8. No gibberellic acid applied and there will be no more applications this season.
9. Based on a 34 day round as in the feed wedge below, and taking into account an allowance for autumn silage feeding of 7.7kg/cow/day, the farm has a small feed surplus. The average cover is 2534 kg DM/ha, up 29kg DM/ha over the week. We are also looking to run our covers down by using an autumn cover track. Given how wet the farm is we are concentrating on making sure we utilize pasture well in the short term and have the farm well positioned close to dry off targets should we have to dry off early.



Feeding Management

10. Cows are currently producing 1.33 kg MS/day and the whole herd gained 1kg liveweight. As the cow numbers have dropped the whole herd average liveweight is no longer as meaningful as when cow numbers were consistent. Cows were fed pasture plus 7.7kg/DM high quality pasture silage/cow/day. The ME calculator estimates that based on MS production and weight change the cows have eaten 8 kg DM/day of 12.4 MJME pasture cow/day plus silage as mentioned.
11. This week's wedge is printed below:



12. Data sheet

LUDF Weekly Report	16-Apr-13	23-Apr-13	30-Apr-13	7-May-13
Farm grazing ha (available to milkers)	160	160	160	160
Dry Cows on farm / East blk / other	0/4/0	0/4/0	0/23/0	0/30/0
Culls (Includes culls put down & empties)	37	0	0	33
Culls total to date	66	66	66	99
Deaths (Includes cows put down)	0	0	0	0
Deaths total to date	11	11	11	11
Calved Cows available (Peak Number 632…)	571	571	552	530
Treatment / Sick mob total	0	3	3	0
Mastitis clinical treatment	0	1	0	0
Mastitis clinical YTD (tgt below 64 year end)	75	76	76	76
Bulk milk SCC (tgt Ave below 150)	151	137	147	159
Lame new cases	5	0	42	19
Lame year-to-date	270	0	315	334
Lame days YTD (Tgt below 1000 year end)	4809	0	5201	5397
Other/Colostrum	0	0	3/0	0/0
Milking twice a day into vat	570	567	549	514
Milking once a day into vat	28	28	0	0
Small herd	167	167	0	0
Main Herd	403	400	549	514
MS/cow/day (Actual kg / Cows into vat only)	1.50	1.47	1.44	1.33
MS/cow to date (total kgs / Peak Cows 632	431	441	451	457
MS/ha/day (total kgs / ha used	5.62	5.19	4.93	4.28

LUDF Weekly Report continued ….	16-Apr-13	23-Apr-13	30-Apr-13	7-May-13
Herd Average Cond'n Score	4.4	4.40	4.30	0.00
Monitor grp LW kg WOW 157 early MA calvers	498	500	501	0
Soil Temp Ave Aquaflex	12.1	12.6	12.3	11.1
Growth Rate (kgDM/ha/day)	47	58	50	46
Plate meter height - ave half-cms	15.2	14.7	14.3	14.5
Ave Pasture Cover (x140 + 500)	2624	2557	2505	2534
Surplus/[deficit] on feed wedge- tonnes	[5]	[2.8]	[8]	6
Pre Grazing cover (ave for week)	3627	3725	3553	3339
Post Grazing cover (ave for week)	1700	1700	1700	1700
Highest pre-grazing cover	3762	3804	3880	3412
Area grazed / day (ave for week)	4.85	4.74	4.64	4.20
Grazing Interval	33	34	34	38
Milkers Offered/grazed kg DM pasture	0.0	13.8	8.0	6.0
Estimated intake pasture MJME	0	168	98	73
Milkers offered kg DM Grass silage	0	4	6	8
Silage MJME/cow offered	0	11	11	11
Estimated intake Silage MJME	0	41	63	87
Estimated total intake MJME	0	209	161	160
Tgt total MJME Offered/eaten (incls 6% waste)	0	0	0	0
Pasture ME (pre grazing sample)	0.0	0.0	0.0	0.0
Pasture % Protein	0.0	0.0	0.0	0.0
Pasture % DM - Concern below 16%	0.0	0.0	0.0	0.0
Pasture % NDF Concern < 33	0.0	0.0	0.0	0.0
Mowed pre or post grazing YTD	711.7	711.7	711.7	711.7
Total area mowed YTD	749.6	749.6	749.6	749.6
Supplements fed to date kg per cow (632 peak)	407.9	430.7	465.5	511.0
Supplements Made Kg DM / ha cumulative	368.17	368.17	368.17	368.17
Units N applied/ha and % of farm	0	25units/28%	25units/26%	0
Kgs N to Date (whole farm)	339	346	351	351
Rainfall (mm)	2	34.2	0.4	64.6
Aquaflex topsoil relative to fill point tgt 60 - 80%	30-60	50-100	50-90	100-100

Our next farm walk will be Tuesday 14th May.

Farmers or their managers and staff are always welcome to walk with us. Please call to notify us of your intention and bring your plate meter. Phone SIDDC – 03 325 3629.

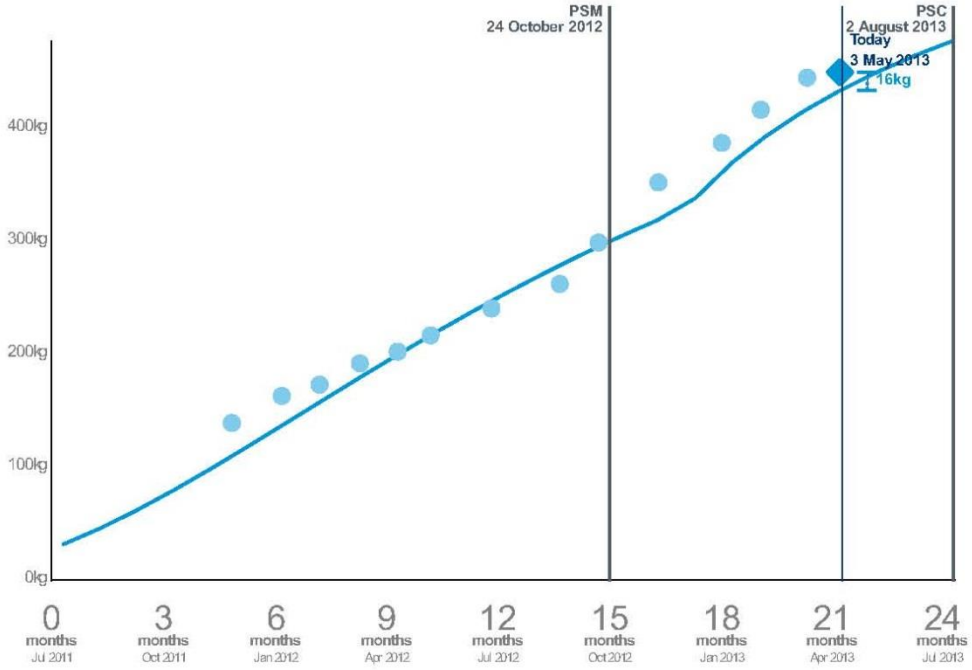
Management Group
Peter Hancox (Farm Manager), Steve Lee (DairyNZ).

LUDF Young Stock Trend and Weight Ranges

Overview of 2011 Spring as at 1/05/2013

Young stock trend

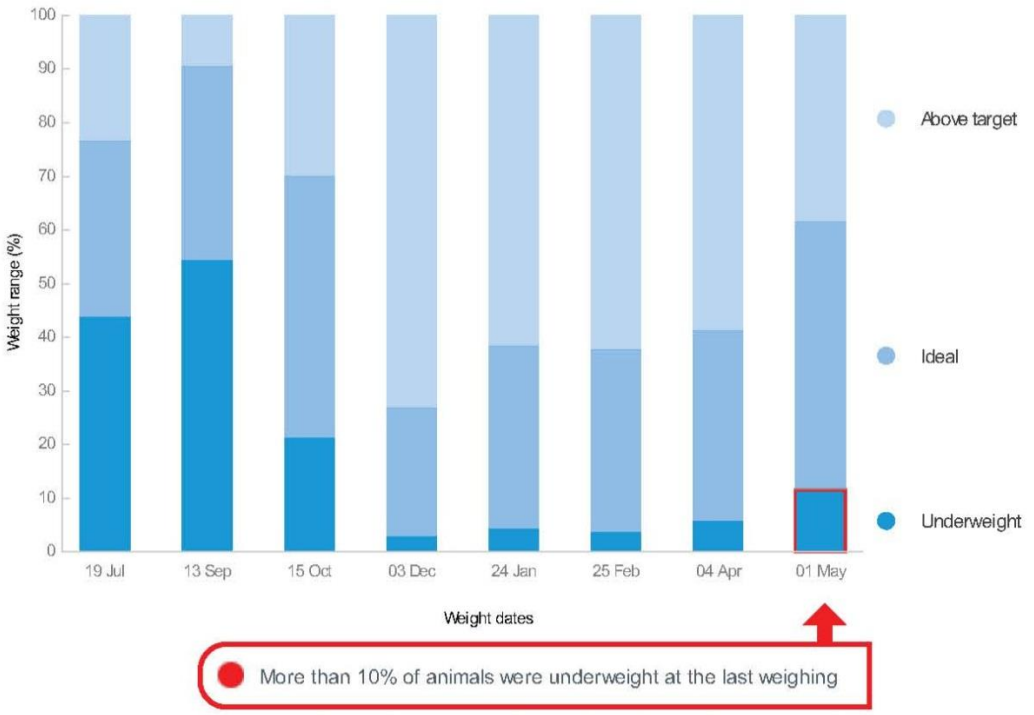
All 138 animals in this weighing are displayed



LIC

Ranges for 2011 Spring as at 1/05/2013

Weight ranges

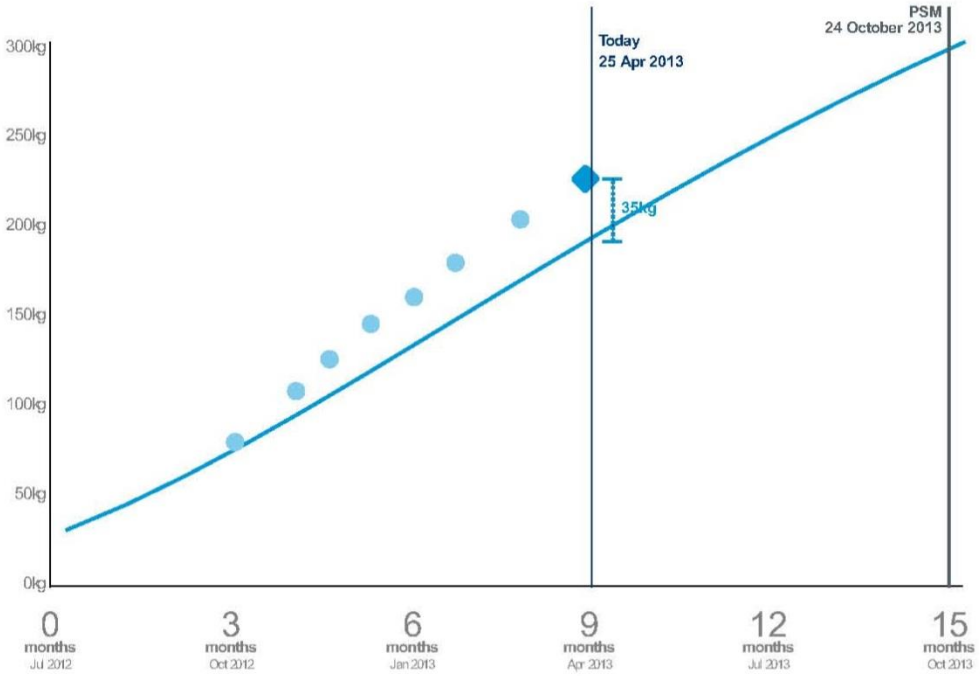


Range	July 2012		September 2012		October 2012		December 2012		January 2013		February 2013		April 2013		May 2013	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Above target	32	23.4	13	9.6	41	29.9	101	73.2	85	61.6	86	62.3	81	58.7	53	38.4
Ideal	45	32.8	49	36	67	48.9	33	23.9	47	34.1	47	34.1	49	35.5	69	50
Underweight	60	43.8	74	54.4	29	21.2	4	2.9	6	4.3	5	3.6	8	5.8	**16**	**11.6**
Total animals	137		136		137		138		138		138		138		138	

Overview of 2012 Spring as at 22/04/2013

Young stock trend

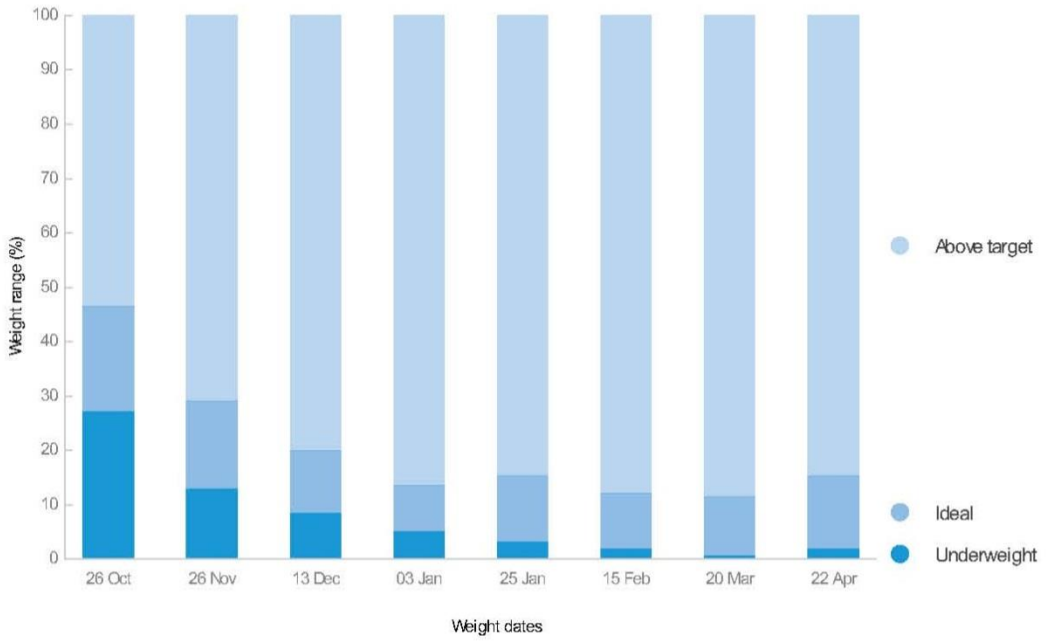
All 156 animals in this weighing are displayed



LIC

Ranges for 2012 Spring as at 22/04/2013

Weight ranges



Range	October 2012		November 2012		December 2012		January 2013		January 2013		February 2013		March 2013		April 2013	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Above target	83	53.5	110	71	124	80	134	86.5	132	84.6	137	87.8	138	88.5	132	84.6
Ideal	30	19.4	25	16.1	18	11.6	13	8.4	19	12.2	16	10.3	17	10.9	21	13.5
Underweight	42	27.1	20	12.9	13	8.4	8	5.2	5	3.2	3	1.9	1	0.6	3	1.9
Total animals	155		155		155		155		156		156		156		156	

Farming Profitably Within a Nitrogen Limit

LUDF Strategic objective 2011-2015:

To maximise sustainable profit embracing the whole farm system through:

- *increasing productivity;*
- *without increasing the farm's total environmental footprint;*
- *while operating within definable and acceptable animal welfare targets; and*
- *remaining relevant to Canterbury (and South Island) dairy farmers by demonstrating practices achievable by leading and progressive farmers.*
- *LUDF is to accept a higher level of risk (than may be acceptable to many farmers) in the initial or transition phase of this project.*

In the initial two seasons of this phase, LUDF used additional Eco-n to help mitigate the impact of increased productivity on the farms environmental footprint. The temporary suspension of sales of this product earlier this year has required LUDF to reconsider how the N-loss component of its footprint can be maintained at or lower than previous levels, while not reducing profitability.

Three important criteria evolved:

1. LUDF must retain the objective above, ie there is no tolerance from SIDDC / Lincoln University to change the farms objective given the mitigation options have changed.
2. LUDF must seek to keep its N-loss from the milking platform at or lower than previous levels – while nutrient trading may become a viable means of meeting overall N-loss targets, LUDF must not use lower leaching losses on another block to offset higher losses (without eco-n) from the milking platform.
3. Real reductions in N loss must be sought; LUDF must make changes that will result in a real improvements in N-loss, not simply seek tweaks to modelled losses. Where models such as Overseer cannot capture the likely change in nutrient loss, LUDF must document the modelled vs expected loss and continue to pursue real reductions.

There was also a strong desire to (as much as possible) retain the same farming system as operated for the past 2 years.

A number of options were canvassed, from adopting the 'LSE' farmlet model at the Lincoln University Research Dairy Farm (LURDF) to tweaking various other factors that contribute to N loss at LUDF. Interim data from the LSE farmlet model was presented at the February 2013 LUDF focus day; the farmlet runs 3.5 cows/ha, uses 150-200kgN and last year produced over 500kgMS/cow or 1750kgMS/ha with only 20kg/cow bought in feed.

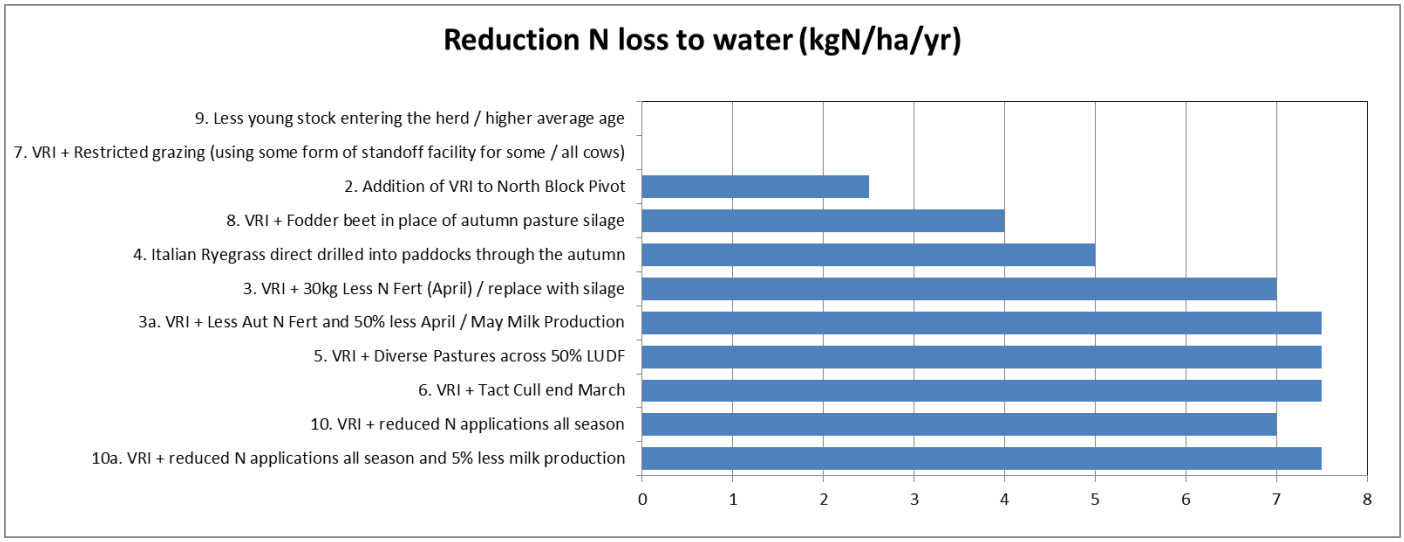
To retain much the same farm system – ie 630 cows peak milked (3.93 cows/ha), producing 475-500kgMS/cow and greater than $4000/ha profit at $6.00/kgMS required changes that would decrease N surplus and therefore N loss to water by around 6-8kg Nitrate-Nitrogen/ha.

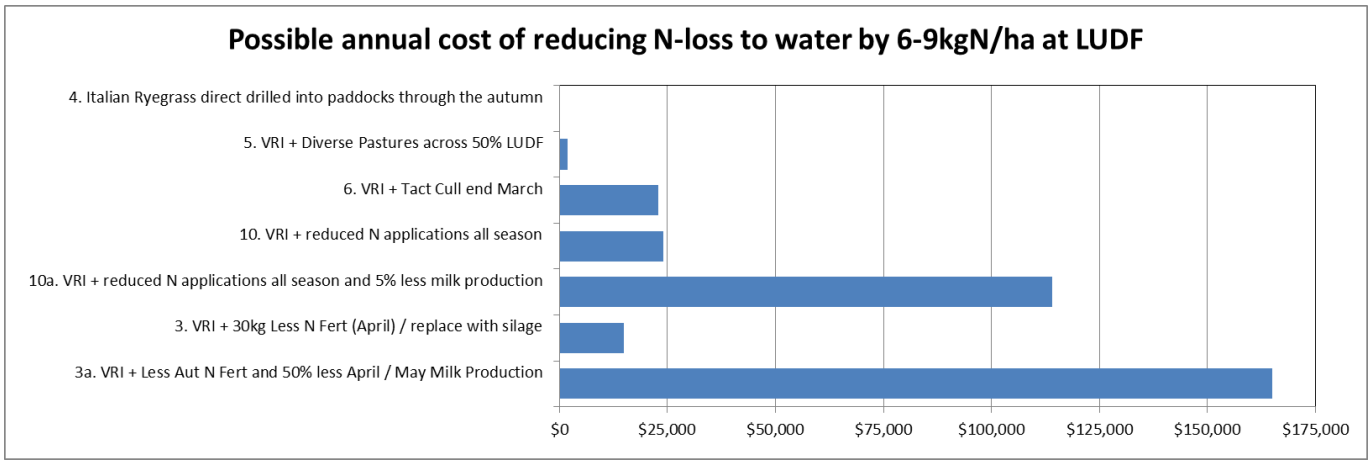
The following range of options to reduce N-loss to water from the milking platform were explored, using Overseer where possible to indicate the likely effect on the N losses, while also considering the probable environmental effect for LUDF, practicality and impact on profitability. For example, LUDF largely operates irrigation as defined in the 'Active Management' option, so therefore should not claim all of this 'benefit' if adopting full active management.

LUDF data for 2011/12 and 2012/13 were used as base data to compare the impact of the various options on N-loss. The range is the different impact recorded in Overseer in each year for each mitigation option [the effect of using annual data in a 'long term annual average model']. This includes the impact of eco-n – recorded in Overseer as reducing N-leaching by 6kgN/ha in 2011/12 and 8kg/ha in 2012/13.

Possible options to reduce N-loss to water at LUDF:

SUMMARY	Expected Change in N losses	Possible Economic Impact
1. Temporary Suspension of Eco-n	+ 6-8 kgN leached/ha	Saving of $48,000 on Eco-n offset by additional bought in feed of $94,000, **net cost $46,000/yr**
New Base Leaching loss now 6-8 kgN/ha higher than previous levels. Alternative options below investigate the potential to reduce leaching losses at LUDF.		
2. Addition of VRI to North Block Pivot	Decrease of 2-3kgN/ha	Savings on races / pumping costs approx. offset interest / depreciation etc associated with VRI.
3. VRI + 30kg Less N Fert (April) / replace with silage	Decrease of 6-8kgN/ha	Saving of $9,000 on N offset by additional bought in feed of $24,000, **net cost $15,000/yr**
3a. VRI + Less Aut N Fert and 50% less April / May Milk Production	*Decrease of 6-9kgN/ha*	*Further cost $150,000/yr lost milk income* ***= net cost $165,000/yr***
4. Italian Ryegrass direct drilled into paddocks through the autumn	Estimated (not modelled) decrease of 5kgN/ha	Minimal
5. VRI + Diverse Pastures across 50% LUDF	Decrease of 6-9kgN/ha	Net Cost $2,000/yr for diverse pasture seed. Presumes no pasture yield penalty or corresponding milk production penalty
6. VRI + Tact Cull end March	Decrease of 6-9kgN/ha	Saving of $9,000 on N offset by decreased production of 5400kgMS @ $6/kgMS = $32,000, **net cost $23,000/yr**
7. VRI + Restricted grazing (using some form of standoff facility for some / all cows)	Still being determined	Requires infrastructure investment and probable system change to maximise value
8. VRI + Fodder beet in place of autumn pasture silage	Decrease of 3-5kgN/ha	Not evaluated due to limited effect on N loss.
9. Less young stock entering the herd / higher average age	Negligible impact on N loss to water.	Not evaluated in this context
10. VRI + reduced N applications all season	Decrease of 6-8kgN/ha	Saving of $31,000 on N offset by additional bought in feed of $55,000, **net cost $24,000/yr**
10a. VRI + reduced N applications all season and 5% less milk production	*Decrease of 6-9kg/ha*	*Reduction 15,000kgMS or $90,000/yr lost milk income* ***= net cost $114,000/yr***





Summary:

It's possible in a standalone model to predict the effect of various mitigation strategies on N-loss. The actual results from any one of these strategies will depend on the assumptions made and actual results achieved at the end of the season. When comparing possible environmental and economic effects, the farm system is vulnerable to lower milk production reducing income; predicted N-losses however show little change if production decreases. (eg 3 and 3a or 10 and 10a above)

The option to tactically cull in autumn, compared to reducing N application rates all season, for example, appears to have a similar environmental and economic effect, unless reducing N applications all season results in less milk production and therefore less income.

Plan for 2013-14:

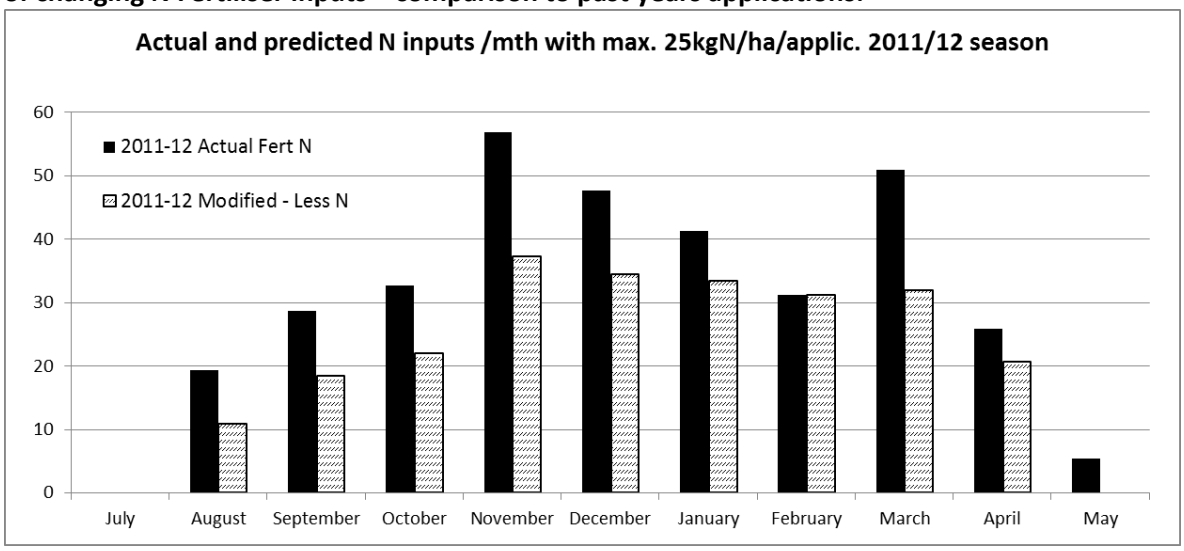
	2012/13	**2013/14**
Total Cows Wintered	650	650
Peak cows milked	630	630
Target (Forecast) Milk /cow	500kgMS/cow	475-500
Eco-n application	3	none
Nitrogen Fertiliser rate	25-40kgN/ha/application	25kgN/ha/application
Nitrogen Fert timing	July – April	July–April, No N applied after 30 April.*
Total Nitrogen applied	359kgN/ha (est)	260kgN/ha
Regrassing	2 paddocks, one with Diverse pastures (plan had been 3 paddocks this year also)	3 paddocks /year, all with Diverse Pastures and direct drill 3-6 paddocks /year with Italian Ryegrass after grazing in March
Culling / Drying Off	Through Apr as feed supply / CS dictates	Through April as feed supply / CS dictates
Irrigation Management	Via Soil moisture monitoring + weather forecast	As 2012/13 and with VRI on Nth Pivot
Gibberellic Acid	Late Aug to late Sep and Mar / early Apr	Late Aug to late Sep and Mar / early April
Pasture Silage bought in	Approx. 500kgDM/cow	500kgDM/cow as in 2012/13 + Provision for additional 400 kgDM/cow to partially replace N fert, eco-n etc
Estimated N Loss to water	26-33kgN/ha (with Eco-n) or **24-31kgN/ha** (with Eco-n) if adjust for current 'Active' Irrigation mgmt.	20-25kgN/ha

** Applying N fertiliser in in July, August and April carries higher risk but provides important shoulder season feed supply. Lower rates of application, but retaining late winter / early spring, and autumn applications are included in the Estimated N-loss to water shown above.*

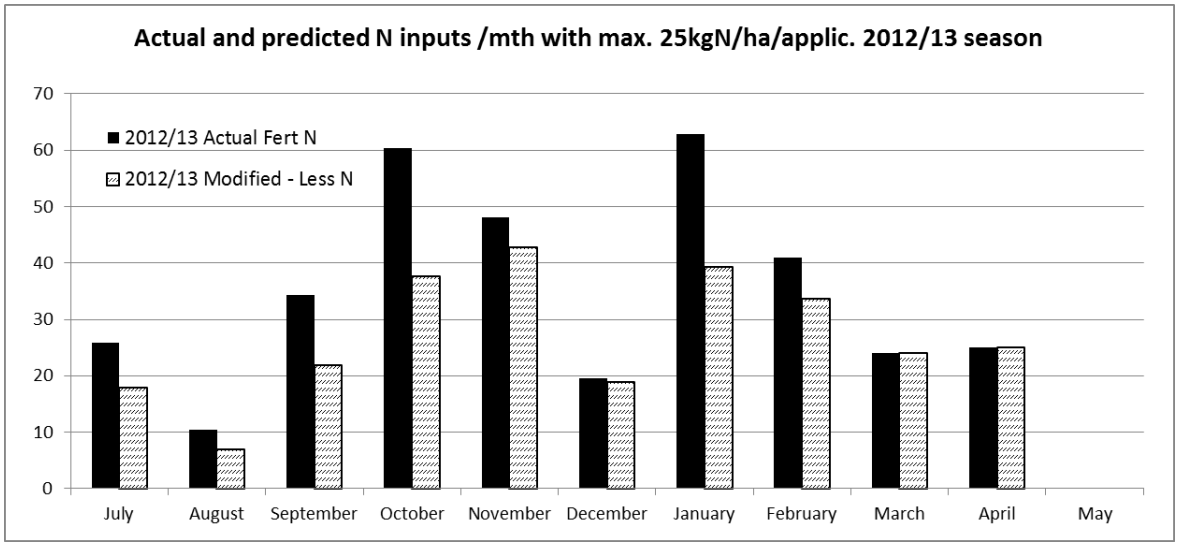
This proposal has substantial stretch and relies on highly efficient dry matter responses to all N-fertiliser applications, combined with efficient conversion of pasture into milk. A contingency of an additional 400kgDM/cow bought in grass silage has been allowed to provide some buffer for the feed previously grown with higher N fertiliser inputs and retained N with the use of eco-n. Theoretically there is enough Nitrogen available in the system to grow the required pasture for 630 cows producing 500kgMS/cow.

The draft budget on this basis delivers a dairy operating profit of approximately $4000/ha at the current payout.

Impact of changing N Fertiliser inputs – comparison to past years applications:



Total N as applied 2011/12 = 340kgN/ha. If each application had been reduced to 25kgN/ha, the predicted annual total would have been 239kgN/ha.



Total N as applied 2012/13 = 351kgN/ha. If each application had been reduced to 25kgN/ha, the predicted annual total would have been 268kgN/ha.

Footnote – N uptake in Pasture (not accounting for nutrient recycling associated with grazing)

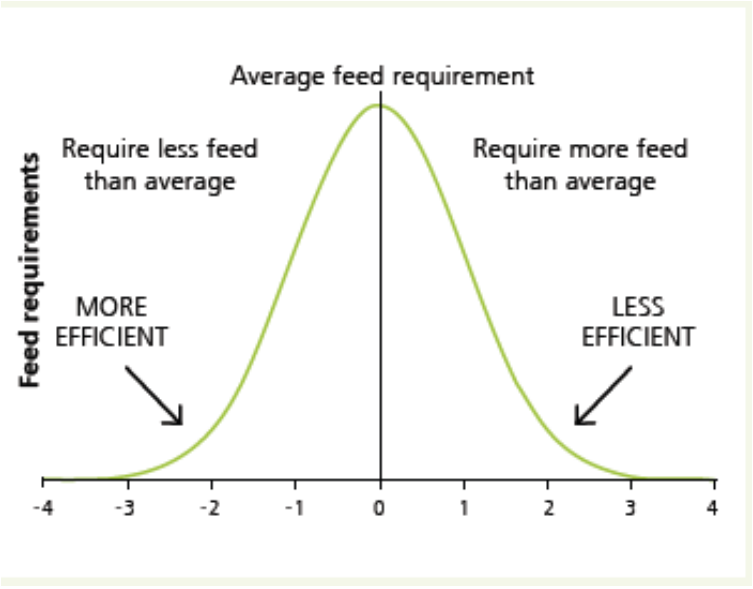
Pasture at 3.6-3.9%N has approximately 108 – 117 kgN when at 3000kgDM/ha
Grazing to 1500kgDM/ha removes half of this; potentially soil needs to supply approx. 50-60kgN if growing 1500 kgDM between grazings. Applying at 25kgN/ha means ½ required N coming from fertiliser.
Annual N uptake – 15-20tonne DM/ha @ 3.75%N = 560- 750kgN/ha/year used in plant production

Feed Conversion Efficiency or Residual Feed Intake [RFI]

K McDonald, G Waghorn, DairyNZ; R Spelman, S Davis, LIC.

Feed Conversion Efficiency Project

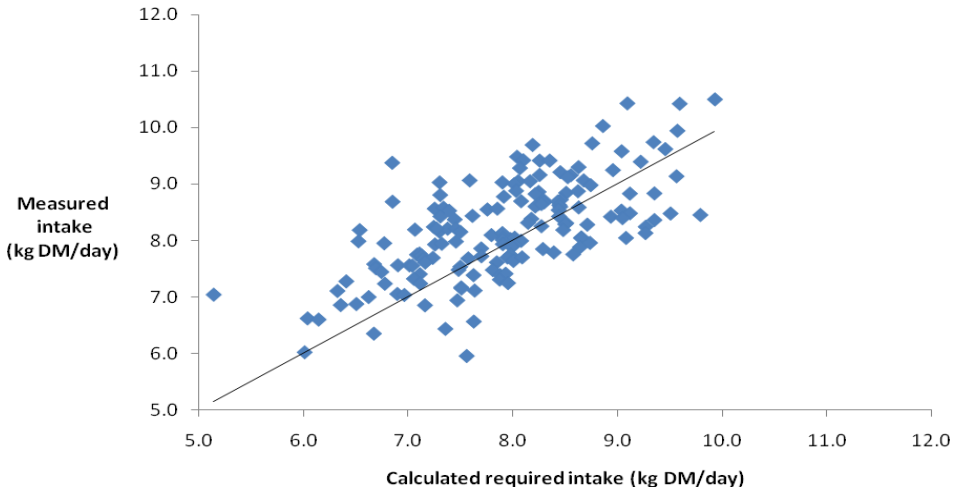
- Joint project
- Holstein-Friesian – high BW
- DairyNZ – rearing and trial work
- LIC – calf identification and genomics
- Residual feed intake [RFI]



- To identify dairy cows that use feed more efficiently [low RFI]
- Develop a genetic marker for the RFI trait

Calves

- Purchased 1250 calves @ 4 d
- 1050 in pens at 6-9 month for 60 d
- Measured intake, Lwt, Lucerne cubes



Residual Feed Intake	Low	High
Efficiency	**Most**	**Least**
Age [days]	217	217
BW	148	148
Mid trial weight [kg]	15	196
DMI [kg/d]	6.0	7.5
Daily gain [kg]	0.88	0.87
Divergence	**-0.77**	**+0.69**

Is ranking for RFI maintained when lactating?

- 40 most and 40 least efficient – 35 d
- 2 trials, Sept – 71 DIM; Nov – 98 DIM
- Fed pasture / lucerne cubes

Residual Feed Intake	Low	High
Efficiency	**Most**	**Least**
Milkfat [kg/day]	0.57	0.57
Protein [kg/day]	0.48	0.47
Mean Lwt [kg]	407	401
DMI [kg DM/day]	18.9	19.1
Divergence [kg DM]	**- 0.31**	**+ 0.31**

Validation of genetic markers

- Screened 3000+ cows
- 212 cows purchased
- Selected from top and bottom 300

Residual Feed Intake	Low	High
Efficiency	**Most**	**Least**
September	- 0.37	+ 0.37
November	- 0.24	+ 0.27
January	- 0.55	+ 0.59
April	- 0.24	+ 0.20
Average	**- 0.35**	**+ 0.36**

- Delivering to farmers
- LIC have BV for RFI – Hostein-Friesian
- Economic value of $85/yr for each kg DN gain in efficiency.

Multiple NZ Funders: Ministry of Business, Innovation & Employment; DairyNZ; LIC; NZ Trade & Enterprise. Collaboration with DPI Victoria; Department of Primary Industries; Gardiner Foundation; Dairy Futures, CRC.