SIDDC
South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying

Lincoln University
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Plant & Food RESEARCH
RANGAHAU AHUMĀRA KAI

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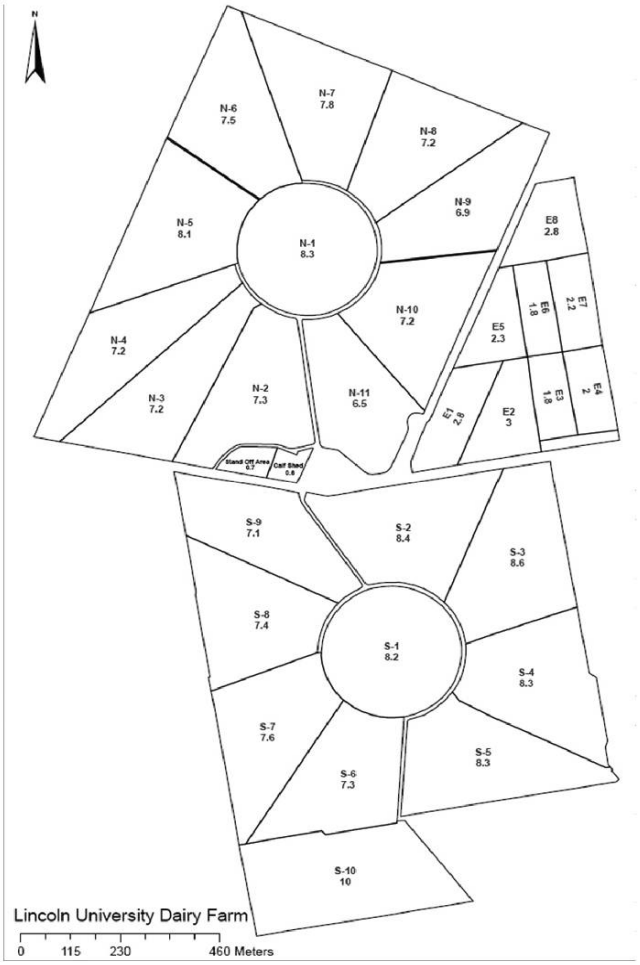
Phone: +64 3 325 3629
Fax: +64 3 325 3603
Email: office@siddc.org.nz
www.siddc.org.nz

Lincoln University Dairy Farm Focus Day 8 May 2014



Staff

Peter Hancox – Farm Manager
Adam Vollebregt – 2IC
Alistair Linfoot – Farm Assistant
Isaac Vollebregt – Farm Assistant

LUDF Hazards Notification

1. Children are the responsibility of their parent or guardian
2. Normal hazards associated with a dairy farm
3. Other vehicle traffic on farm roads and races
4. Crossing public roads
5. Underpass may be slippery

Please follow instructions given by event organisers or farm staff

Introduction

The 186 hectare irrigated property, of which 160 hectares is the milking platform, was a former University sheep farm until conversion in 2001. The spray irrigation system includes two centre pivots, small hand shifted lateral sprinklers, and k-lines. The different soil types on the farm represent most of the common soil types in Canterbury.

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.*

Additional objectives

- To develop and demonstrate world-best practice pasture based dairy farming systems and to transfer them to dairy farms throughout the South Island.
- To consider the farms full environmental footprint, land requirement, resource use and efficiency in system decision making and reporting
- To use the best environmental monitoring and irrigation management systems in the development and implementation of practices, that achieve sustainable growth in profit from productivity and protection of the wider environment.
- To ensure optimal use of all nutrients on farm, including effluent, fertiliser, nutrients imported from supplements and atmospheric nitrogen; through storage where necessary, distribution according to plant needs and retention in the root zone.
- To continue the environmental monitoring programme and demonstrate technologies and farming practices that will ensure the average annual concentration of nitrate-N in drainage water from below the plant root zone remains below the critical value [16 mg N/L] specified in ECan's proposed regional rule in order for LUDF to remain a 'permitted activity' [Rule WQL20].
- To store and apply effluent such that there is no significant microbial contamination of the shallow aquifers.
- To manage pastures and grazing so per hectare energy production is optimised and milkers consume as much metabolisable energy [ME] as practicable.
- To optimize the use of the farm automation systems and demonstrate / document improved efficiencies and subsequent effect on the business.
- To achieve industry targets for mating performance within a 10 week mating period, including a 6 week in-calf rate of 79% and 10 week in calf rate greater than 89% i.e. empty rate of less than 11%.
- To continue to document and measure LUDF's influence on changes to defined management practices on other dairy farms.
- To ensure specific training is adequate and appropriate to enable staff members to contribute effectively in meeting the objectives of the farm.
- To operate an efficient and well organised business unit.
- To generate profit through tight cost control with appropriate re-investment and maintenance of the resources.
- To create and maintain an effective team environment at policy, management and operational levels.
- To actively seek labour productivity gains through adoption of technologies and practices that reduces labour requirements or makes the work environment more satisfying.
- To assist Lincoln University to attract top quality domestic and international students into the New Zealand dairy industry.

Ongoing research

- The effect of fertilisers & other farm inputs on groundwater. 10 groundwater monitoring wells sunk to monitor and manage the effect of fertiliser, grazing, irrigation and effluent inputs over a variety of contrasting soil types.
- Effects of eco-n on nitrate leaching and pasture production.
- Pasture growth rates, pests and weeds monitoring.
- The role of nutrition in lameness in Canterbury.
- Resource Inventory and Greenhouse Gas Footprint

Climate

Men Annual Maximum Temperature	32° C
Mean Annual Minimum Temperature	4° C
Average Days of Screen Frost	36 Days per annum
Mean Average Bright Sunshine	2040 Hours per annum
Average Annual Rainfall	666 mm

Farm area

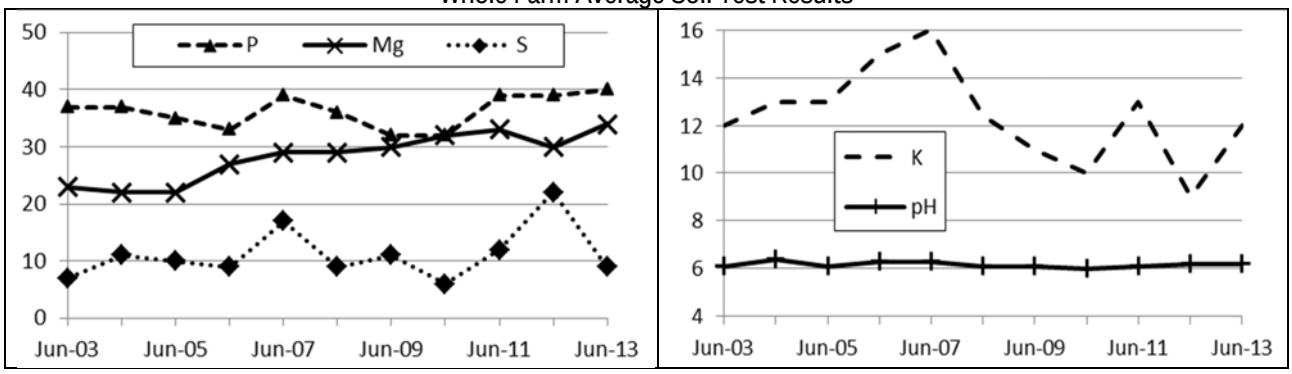
Milking Platform	160 ha
Runoff [East Block]	15 ha
Unproductive land on platform	6.7 ha

Soil types	% Milking Platform		% Milking Platform
Free-draining shallow stony soils (Eyre soils)	5	Imperfectly drained soils (Wakanui soils)	30
Deep sandy soils (Paparua & Templeton soils)	45	Heavy, poorly-drained soils (Temuka soils)	20

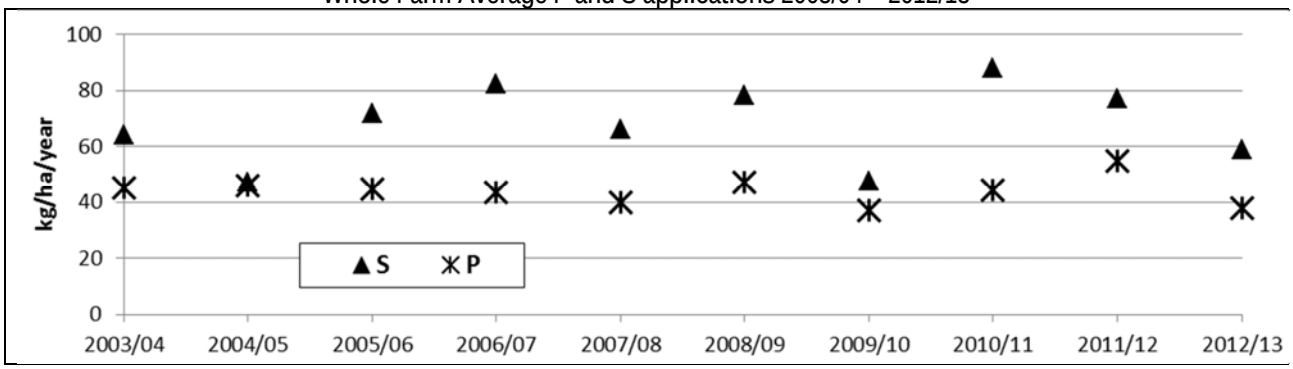
Soil test results and Fertiliser Applications

Target Soil Test Ranges: pH: 5.8 – 6.2, P: 30 – 40, K: 5 – 8, S: 10 – 12, Mg: 20+

Whole Farm Average Soil Test Results



Whole Farm Average P and S applications 2003/04 – 2012/13



Pasture

The milking platform was sown at conversion [March 2001] in a mix of 50/50 Bronsyn/Impact ryegrasses with Aran & Sustain white clovers, and 1kg/ha of Timothy

Paddock	Period Regrassed	Grass Cultivar	Paddock	Period Regrassed	Grass Cultivar
N1	Feb-01	Brons. Imp	S1	Dec-05	Bealey
N2	Feb-11	Trojan	S2	Dec-10	Troj. Bealey
N3	Nov-12 / Sept 13	Shogun + Chicory /Plantain	S3	Feb-10	Bealey
N4	Feb-01	Brons. Imp	S4	Dec-13	Bealey/Chicory/Plantain/Troj
N5	Dec-11 / Aug 13	Shogun	S5	Dec-08	Arrow - Alto
N6	Feb-01	Brons. Imp	S6	Dec-06	Arrow - Alto
N7	Jan -14	Bealey/Chicory/Plantain/Troj	S7	Sep-06	Arrow - Alto
N8	Jan -13	Bealey/Chicory/Plantain	S8	Oct-11	Troj. Bealey
N9	Oct-13	Bealey/Chicory/Plantain/Troj	S9	Dec-09	Bealey
N10	Jan-12	Tetraploids	S10	Feb-05	Bealey
N11	Nov-07	Bealey	All paddocks also sown with clover		

Irrigation and effluent system

Centre-pivots	127 ha
Long Laterals	24 ha
K-Lines	10 ha
Irrigation System Capacity	5.5 mm/day
Length of basic pivot	402
Well depth	90m

- A full rotation completed in 20.8 hours for 5.5 mm [at 100% of maximum speed].
- Average Annual Rainfall = 666 mm. Average irrigation input applies an additional 450 mm.
- Average Evapotranspiration for Lincoln is 870 mm/year.

Effluent

- Sump capable of holding 33,000 litres and a 300,000 litre enviro saucer.
- 100 mm PVC pipe to base of North Block centre pivot, distribution through pot spray applicators.

Mating programme - Spring 2013

KiwiX DNA for 365 cows (F8-F16); Holstein Friesian Daughter Proven for 280 cows (F0-F7); KiwiX Premier Sires Daughter proven for yearling Heifers. AI mate for 3 weeks in heifers and 6 weeks in main herd then follow with Jersey bulls. Heifers start mating 10 days early. 10 weeks mating for milking herd. Expect to rear 150 heifers.

Herd details – February 2014

Breeding Worth (rel%) / Production Worth (rel%)	129 / 49% 158 / 73%
Recorded Ancestry	99%
Average weight / cow (Dec) – Herd monitored walk over weighing	474 kg [Dec 2012]
Calving start date	Heifers – 23 July, Herd 3 August 2014
Est Median calving date	21 August 2013
Mating start date	25 October 2013

Empty rate (nil induction policy) after 10 weeks mating - 12% (2013-14 mating). 6 week in-calf rate 78%.

	2002/03	Average 03/04 - 06/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
Total kg/MS supplied	228,420	277,204	278,560	261,423	273,605	264,460	297,740	300,484
Average kg/MS/cow	381	425	409	384	415	395	471	477
Average kg/MS/ha	1414	1720	1744	1634	1710	1653	1861	1878
Farm Working Expenses / kgMS	$2.98	$2.68	$3.37	$3.88	$3.38	$3.86	$3.91	$3.84
Dairy Operating Profit/ha	$1,164	$2,534	$8,284	$2,004	$4,696	$6,721	$4,553	$4665
Payout [excl. levy] $/kg [Milk price + div.]	$4.10	$4.33	$7.87	$5.25	$6.37	$7.80	$6.30	$6.12
Return on Assets	4.4%	6.18%	14.6%	4.8%	7%	7%	6%	6%

Stock numbers	2002/03	Average 03/04 - 06/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
1 July cow numbers	631	675	704	704	685	694	665	650
Max. cows milked	604	654	680	683	660	669	632	630
Days in milk			263	254	266	271	272	273
Stocking rate Cow equiv. / ha	3.75	4.05	4.2	4.3	4.13	4.18	3.95	3.94
Stocking rate Kg liveweight / ha	1,838	1964	2,058	2,107	1,941	1914	1860	1878
Cows wintered off No. Cows / Weeks	500 / 8	515 / 7.8	546 / 9	547 / 7	570 / 9	652 / 8.4	650 / 9.8	650/9.8
No. Yearlings grazed On / Off	0/118	0/157	0/171	0/200	0/160	0/166	0/141	0/138
No. Calves grazed On / Off	0/141	0/163	0/200	0/170	0/160	0/194	0/190	0/156
Est. Pasture Eaten (Dairybase) (tDM/ha)			17.9	17.2	16.2	16.9	17.3	16.8
Purch. Suppl - fed [kgDM/cow]	550	317	415	342	259	463	359	434
Made on dairy/platform [kgDM/cow]	0	194	95	64	144	160	154	93
Applied N / 160 eff. Ha			164	200	185	260	340	350

Staffing & Management

Roster System – 8 days on 2 off , 8 days on 3 off

Milking Times - Morning: cups on 5.00am
- Afternoon: cups on 2.30pm

Contents

Profitable or Compromised?

Goal: Maximise sustainable profit while keeping N-losses to previous levels (see strategic objective (page 2) for additional details.

Reality Check: the combination of this seasons growing conditions and the temporary suspension of sales of Eco-n (DCD) in January 2013 were leading LUDF towards higher N-losses this season than past years.

Available Options: Mid-season, in the absence of infrastructure to reduce the time cows spent on the paddock, the available options were limited to changes in feed supply and or demand – through aspects such as use of N-fertiliser, bought in supplements, culling cows and drying off date(s).

Action taken: As productivity (efficiency, rather than turnover) is a key focus for LUDF, the decision was made to stop using purchased supplementary feed and adjust the stocking rate down as required to match the available feed supply.

- N-fertiliser policy was left as budgeted to use the farms ability to grow its feed requirements.
- MT's and culls were progressively dried off and sold to remove their feed demand from the milking platform.
- Low CS cows have subsequently been dried off in accordance with the farms normal drying off rules to achieve CS targets at calving.
- By comparison, in previous seasons 250-300kgDM/cow of purchased supplement (grass / lucerne silage) has been fed through the autumn period.

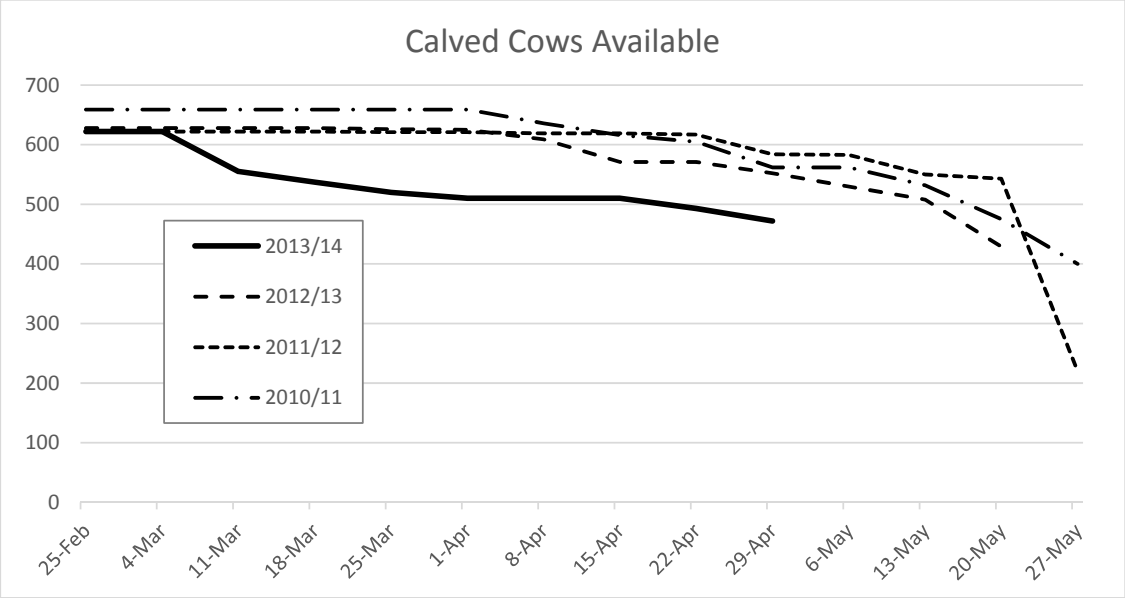
Results:

	Budget for 2013/14	**Forecast (to year end)**
Profit (adjusted to forecast payout of $8.75 incl Dividend)	$8756/ha	$7939/ha
Milk Production	300,000 kgMS	276,000 kgMS
Farm Working Expenses	$1,223,857	$1,168,091
Potential Profit lost due to N-Mitigation changes		$131,000

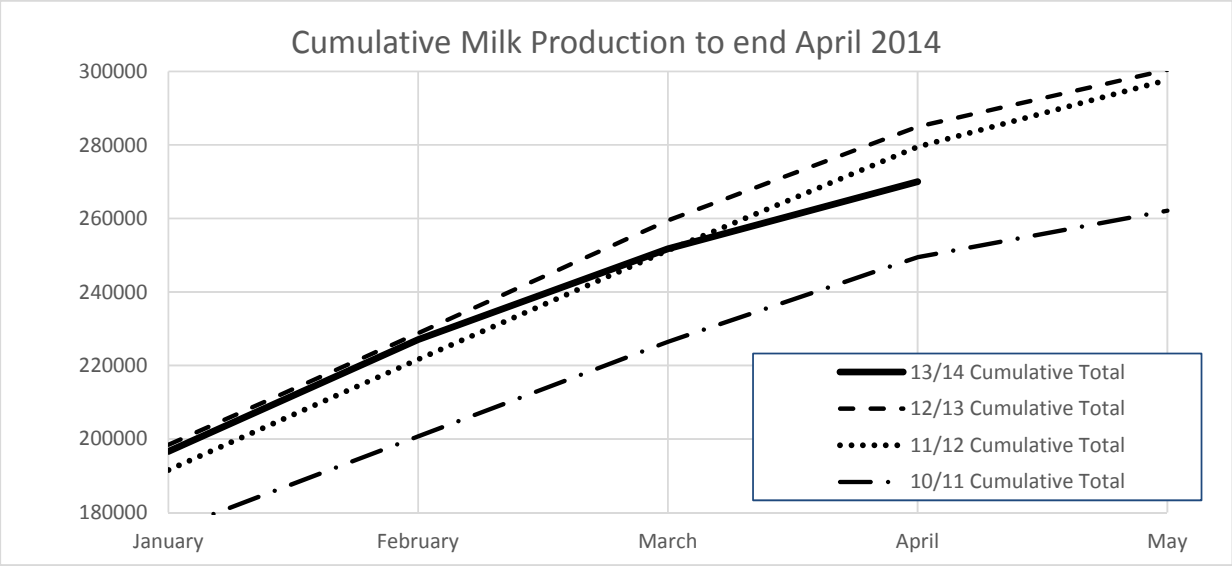
The reduction in farm working expenses is in part related to the early culling / drying off program and reflects less purchased feed (than had been budgeted for) but also includes savings in irrigation power (due to the seasonal weather conditions), less employment costs due to a mid-season staff vacancy and other variations to budget as outlined below. Had the season delivered more typical weather and required more irrigation, these costs would have been higher but is likely to have resulted in higher pasture production, less supplement use, better body condition score and more milk production.

A full profitability analysis including the important comparison to other farmers will be presented in the July focus day handout. A quick analysis yields the following.

Stocking Rate / Calved Cows Available: the graph of cow numbers below shows the effect of early culling on cow numbers.



Production: At the end of February, and prior to implementing the above changes to accommodate N-loss this season, milk production was very similar to 2012/13 and ahead of 2011/12. It was therefore realistic at that stage to believe the farm could again achieve production of 300,000kgMS this season. At the end of March, this seasons production was only 1.5% below the average of the two past years, but one month later total production was 4.5% below the average of 2012/13 and 2011/12. Forecasting to the end of May it is probable the farm will produce about 24,000kgMS less than last year (8%). 24,000kgMS at $8.75 is worth $210,000.

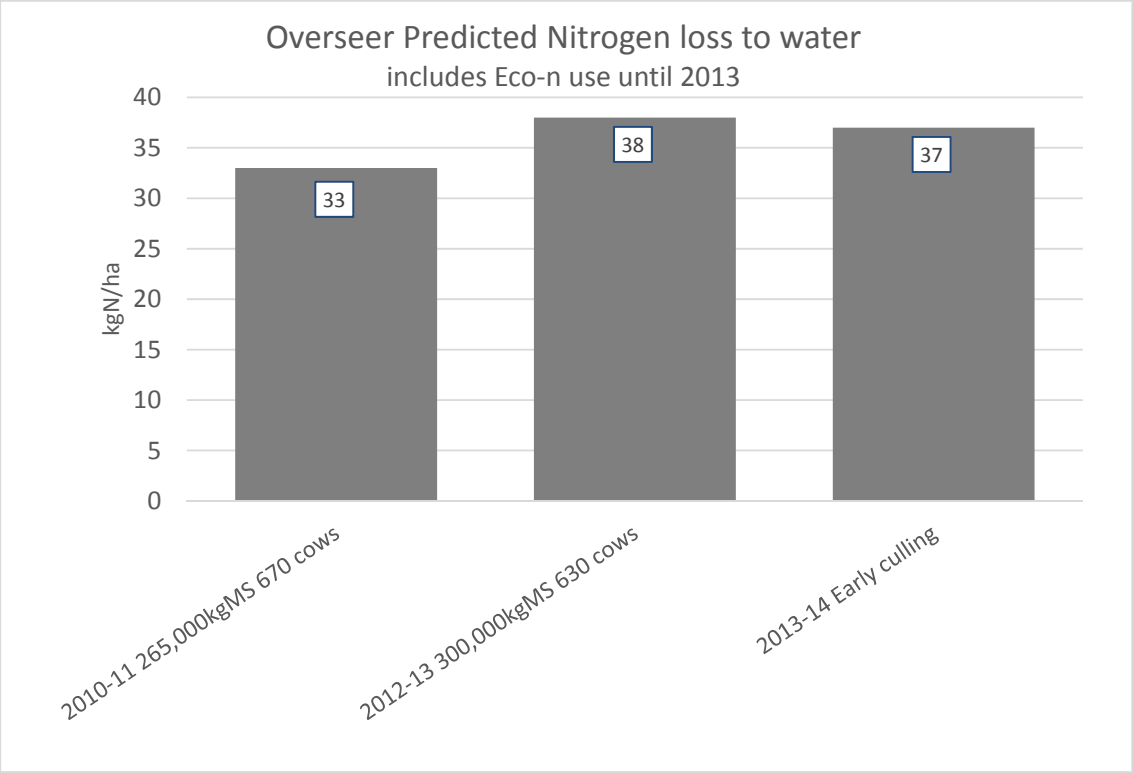


Silage Required: Feed budgeting in early March indicated a further 300t DM silage would be required to keep all cows producing in milk till late May. 300 tDM at 40cents/kgDM would cost $120,000.

Milk Income less Silage Costs: 24,000kgMS at $8.75 would return $210,000. Silage at $120,000 leaves $90,000 as the potential cost or lost profit from choosing to reduce cow numbers to reduce autumn n-leaching.

Summary: The opportunity cost for LUDF in reducing cow numbers through early culling this autumn to reduce N-loss is likely to be between $90,000 and $130,000.

Predicted N-loss to water: Overseer predicts N-loss to water for the 2013-14 season is approximately 37kgN/ha, slightly less than that predicted for last season and less than the initial forecast had LUDF not reduced the autumn stocking rate. *The strategy has therefore been successful from its N-loss perspective.*



Additional details follow on the management of the farm through the autumn, considering the constraints applied to limit N-loss to that achieved previously (including the use of Eco-n). As noted a full profitability analysis will be presented in the July (2014) Focus Day Notes.

Canterbury Land & Water Regional Plan
What does it mean?

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Nitrogen Baseline Compliance Note

April 2014

On 18 January 2014, Environment Canterbury notified the decisions on the proposed Land & Water Regional Plan (pLWRP). The plan includes rules to regulate the use of land for a farming activity and the associated nitrogen loss.

Within nutrient red and lake zones, the rules in the pLWRP require farming activities to restrict their average nitrogen loss calculation to that which occurred during the nitrogen baseline period.

Environment Canterbury recognises that many decisions affecting the way a farm will be operated are typically made in the third quarter of a calendar year.

These operational decisions will have an impact on both the nitrogen loss for the current year (30 June 2013 – 1 July 2014), and the overall nitrogen loss calculation for the next four years. Consequently, full compliance with the nitrogen baseline may be challenging.

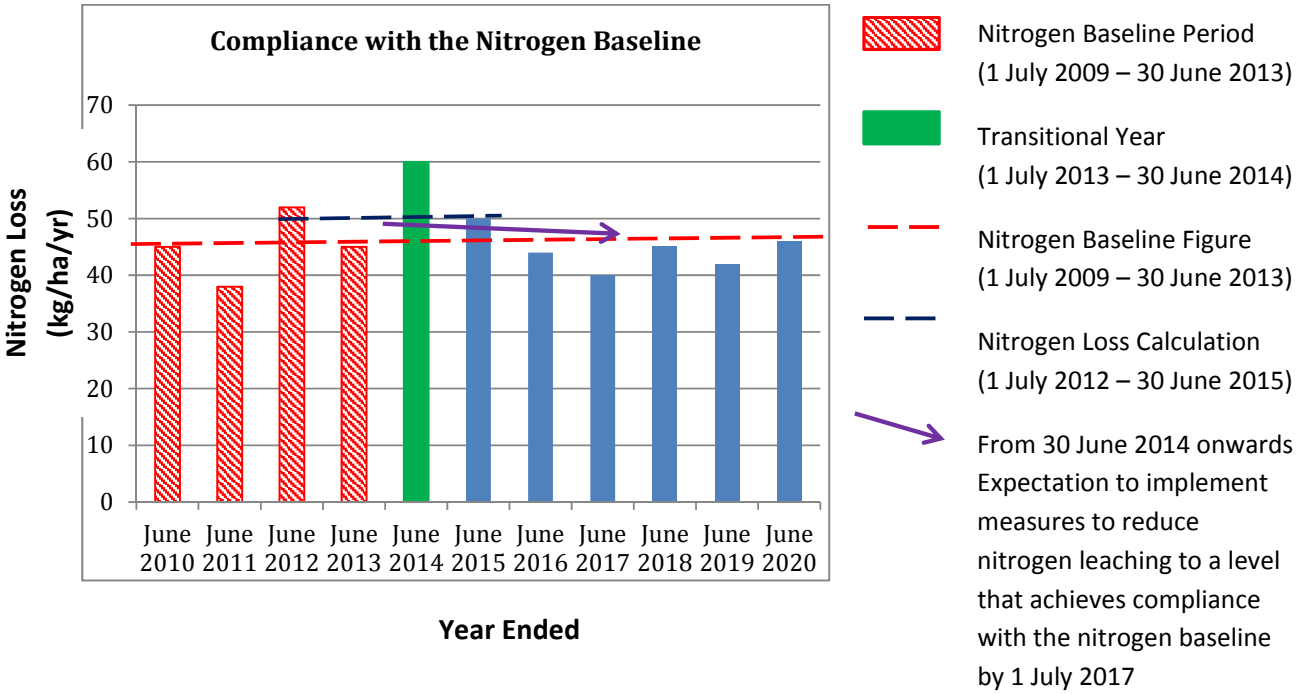
Because these on-farm decisions were made before the pLWRP decisions were notified, there has been limited opportunity for farmers to take into account the constraints of the nutrient management rules.

In recognition of this, Environment Canterbury provides the following advice with regard to the way compliance with the nitrogen baseline will be administered:

- The 1 July 2013 – 30 June 2014 year is a “transitional year” between the nitrogen baseline period and the first full year under the pLWRP nutrient provisions. As a result of this Environment Canterbury anticipates that nitrogen losses may exceed the nitrogen baseline. Farmers will not be penalised if this occurs.

- From 30 June 2014 onwards, Environment Canterbury expects all farmers in red zones and lake zones to introduce management initiatives and practice changes to ensure long-term compliance with their nitrogen baseline. In addition, Environment Canterbury reserves the right to take enforcement action against a farmer if the nitrogen loss calculation for the property is higher than the worst year in the nitrogen baseline period, and there is no evidence of a genuine attempt to remain within the baseline.

- All farmers are expected to be operating at or below their nitrogen baseline after 30 June 2017, and Environment Canterbury recommends that all farmers consider what impacts farm management decisions made now and in future will have on their ability to comply with the nitrogen baseline.



Key terms

Nitrogen baseline means:

(a) the discharge of nitrogen below the root zone, as modelled with OVERSEER™, or equivalent model approved by the Chief Executive of Environment Canterbury, averaged over the period of 1 July 2009 – 30 June 2013, and expressed in kg per hectare per annum, except in relation to Rules 5.46 and 5.62, where it is expressed as a total kg per annum from the identified area of land; and

(b) in the case where a building consent and effluent discharge consent have been granted for a new or upgraded dairy milking shed in the period 1 July 2009 – 30 June 2013, the calculation under (a) will be on the basis that the dairy farming activity is operational; and

(c) if OVERSEER™ is updated, the most recent version is to be used to recalculate the nitrogen baseline using the same input data for the period 1 July 2009 – 30 June 2013.

Nitrogen loss calculation means the discharge of nitrogen below the root zone, as modelled with OVERSEER™, or equivalent model approved by the Chief Executive of Environment Canterbury, averaged over the most recent four-year 1 July to 30 June period and expressed in kg per hectare per annum. If OVERSEER™ is updated, the most recent version is to be used.

LUDF Income and Expenses – Budget, YTD, Forecast to End May

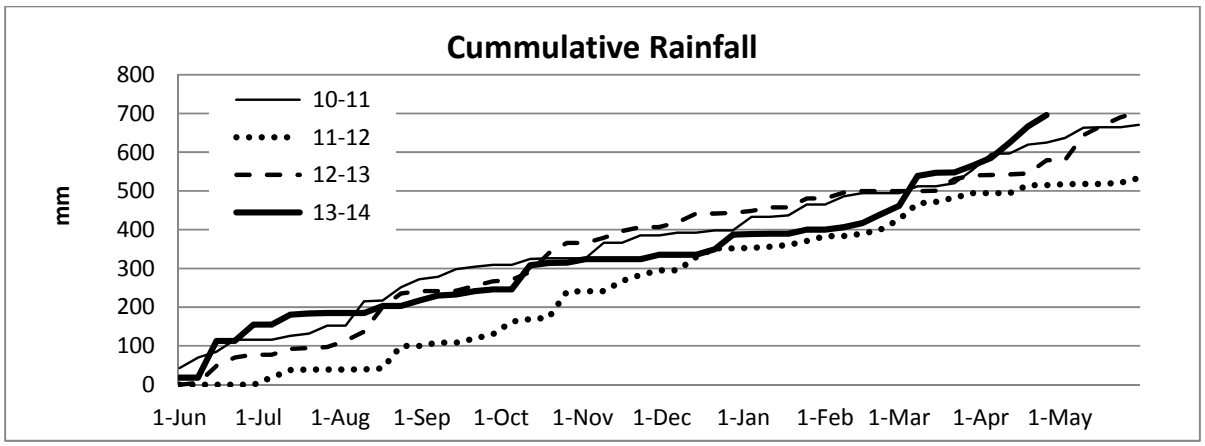
Year ending May 31		2012 -13 Actual	2013/14 Budget	Actual to end Mar	Forecast Year End	Variance Year End (forecast - budget)	Notes
Total Milk production (kgMS)		300,484	300,000	251,759	276,000	-24,000	1
Milk Prod / ha	kgMS/ha	1,878	1,875	1,573	1,725	-150	
Peak Cow Nos and Prod.		630	630	630	630		
Staff		3.7	3.7	3.7	3.7		
Income	Milksolid Payout $/kgMS	$5.80/kgms	$8.65	$8.65	$8.65		2
	Dividend /share	$0.32	$0.10	$0.10	$0.10		2
	Milksolid Revenue	$1,754,827	$2,595,000	$2,177,715	$2,387,400	-$207,600	3
	Dividend	$96,000	$30,000	$25,176	$27,600	-$2,400	3
	Surplus dairy stock	$182,337	$139,015	$107,079	$162,479	$23,464	4
Stock Purchases		-$25,740	-$23,200	-$23,165	-$23,165	$35	
Gross Farm Revenue		**$2,007,424**	**$2,740,815**	**$2,286,805**	**$2,554,314**	**-$186,501**	
Expenses							
Cow Costs	Animal Health	$60,886	$60,066	$39,050	$60,000	-$66	
	Breeding Expenses	$51,644	$48,128	$46,942	$48,142	$14	
	Replacement grazing & meal	$163,852	$148,405	$125,992	$143,992	-$4,413	5
	Winter grazing - Herd incl. freight	$137,904	$154,539	$169,710	$196,530	$41,991	6
Feed	Grass silage purchased	$93,492	$177,534	$112,115	$112,115	-$65,419	7
	Silage making & delivery	$9,087	$9,216	$0	$0	-$9,216	8
	Eco-n & Giberillin	$58,441	$10,487	$7,707	$9,457	-$1,030	9
	Nitrogen	$112,973	$69,949	$64,595	$81,595	$11,646	10
	Fertiliser & Lime	$33,288	$27,901	$37,882	$37,882	$9,981	10
	Irrigation - All Costs	$55,471	$70,600	$28,337	$34,337	-$36,263	11
	Re-grassing	$14,790	$29,688	$30,300	$37,636	$7,948	12
Staff	Employment	$217,865	$248,037	$185,307	$224,416	-$23,621	13
Land	Electricity-farm	$27,049	$26,600	$30,198	$37,198	$10,598	14
	Administration	$21,528	$24,700	$17,936	$24,700		
	Freight & Cartage	$89	$800	$7,235	$7,235	$6,435	15
	Rates & Insurance	$21,020	$21,020	$21,020	$21,020		
	Repairs & Maintenance	$61,766	$54,500	$51,897	$56,500	$2,000	16
	Shed Expenses excl. power	$7,560	$9,850	$6,659	$7,429	-$2,421	
	Vehicle Expenses	$34,922	$31,336	$23,211	$27,398	-$3,938	17
	Weed & Pest	$1,340	$500	$509	$509	$9	
Cash Farm Working Expenses		$1,184,967	$1,223,857	**$1,006,602**	**$1,168,091**	-$55,766	
Depreciation est.		$105,000	$116,000		$116,000		
Total Operating Expenses		$1,289,967	$1,339,857		$1,284,091	-$55,766	
Dairy Operating Profit		$717,457	$1,400,958		***$1,270,223***	***-$130,735***	
DOP/ha		**4,484/ha**	**$8,755.99**		7939	-$817.09	-10%
Cash Operating Surplus		$822,457	$1,516,958				

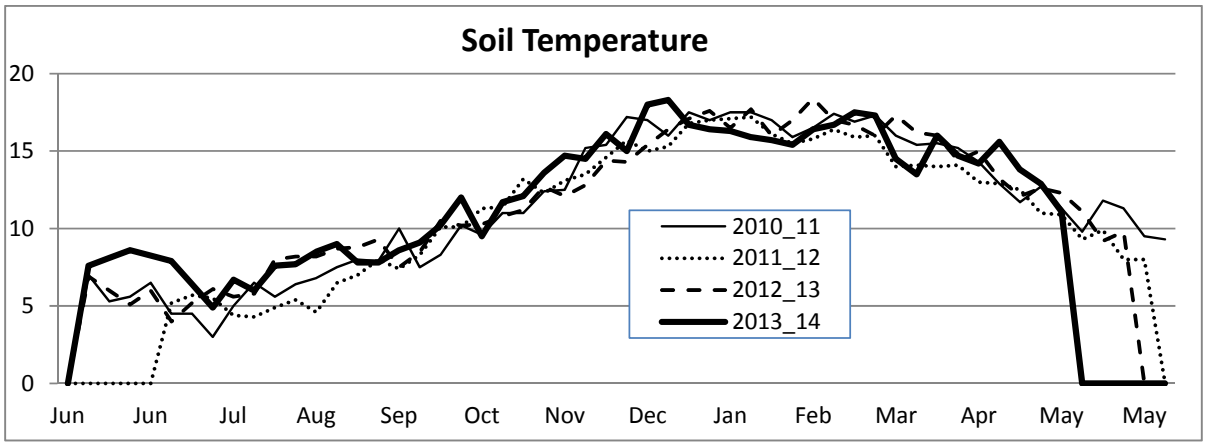
Notes:

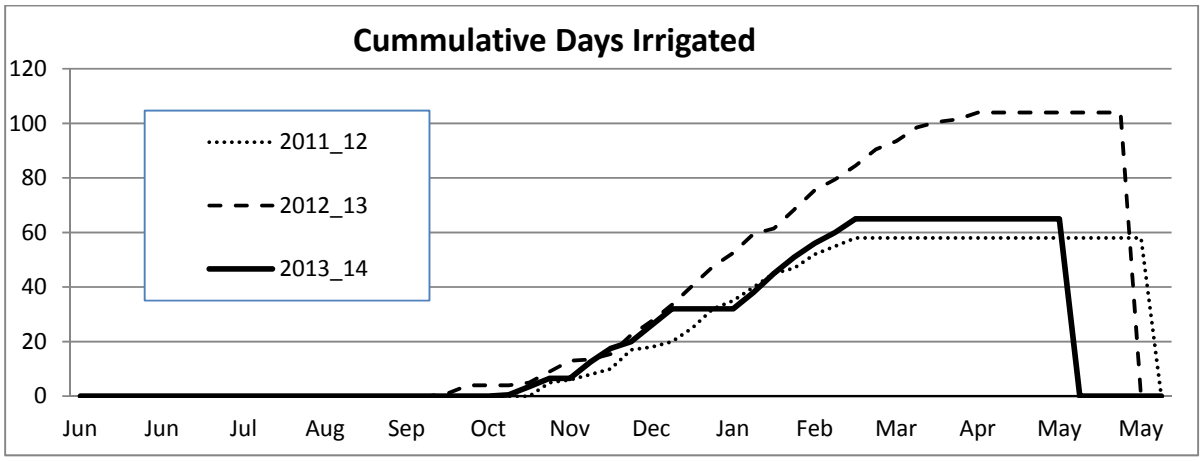
1. Production at 30 April 2014 was 270,423kgMS. Forecast adds 5 days at 400kgMS, 5 days at 300kgMS and 10 days at 200kgMS. Total forecast production 276,000kgMS.
2. The budgeted income has been adjusted from the initial budgeted payout to the current forecast to make a direct comparison more relevant. All other budgeted items are as per the budget at the beginning of the season.
3. Reduction in income associated with reduced production this autumn.
4. Surplus dairy stock reflects prices received for MT cows sold early March and culls sold through March and April.
5. Replacement grazing and meal was above budget at the end of January and now forecast to be below budget, due to variations in timing of selling surplus heifers. in part a continuation of 'saving' of winter grazing in July 2013 for heifers, offset by higher winter cow grazing when heifers were returned to the milking platform due to flooding where they were grazing.
6. Winter grazing reflects the additional grazing purchased last winter plus the cost of purchasing additional dry cows grazing this autumn. Last winter was partly the result of having to find extra grazing for later calving cows due to having heifers home over the winter period (eating feed that we would have had for these later calving cows) and also paying slightly higher winter grazing than we had budgeted for.
7. Additional feed was budgeted to account for the reduction in N-use and loss of Eco-n for this season. As below the decision was made not to use this additional feed.
8. No surplus was available for silage made on the platform.
9. Less GA applied this autumn due to wet weather preventing application within 3 days following grazing.
10. The over run here is due to not budgeting enough in our original budget. Our annual soil test indicated we needed more than we originally budgeted.
11. Irrigation has only been used 2/3 the number of days required in 2012/13 (due to the wetter cooler summer) thus decreasing power use and spending slightly less on R & M to date.
12. Regrassing of N6 in late autumn had not been budgeted for.
13. LUDF lost a staff member at the end of October and were not able to replace them till the beginning of February. This has resulted in using casuals that we would not normally use .We have also not paid as high a salary's as budgeted to date.
14. Farm electricity (dairy shed, not including irrigation power) is going to end up more than we budgeted partly because of the twice daily hot washes required for the milk monitoring meters and also the extra hour a day that the milking machines start up pre milking to put a rinse through the plant to ensure there is no detergent residue.
15. This is higher than budgeted due to extra trucking of later calving cows that we had to find grazing for off farm.
16. The two main over runs in the budget in repairs and maintenance is that we had to replace our submersible pump that supplies our stock water and cowshed water .We also had to replace our underpass effluent pump that was drowned during the winter when we had the heavy rain.
17. The farm ute was upgraded, reducing the substantial R/M costs associated with the previous vehicle.
18. Forecasted Dairy Operating Profit is $7939/ha or $131,000 less than budget (when payout is adjusted to forecast payout).

LUDF Review of the Season to Date

A key aspect of the latter part of the season has been, rain. Whilst Lincoln has not had the rainfall of some areas, March and April were very wet, making grazing residuals hard to attain, putting a strain on extending the round and meaning that from time to time cows had to be stood off on the yard.

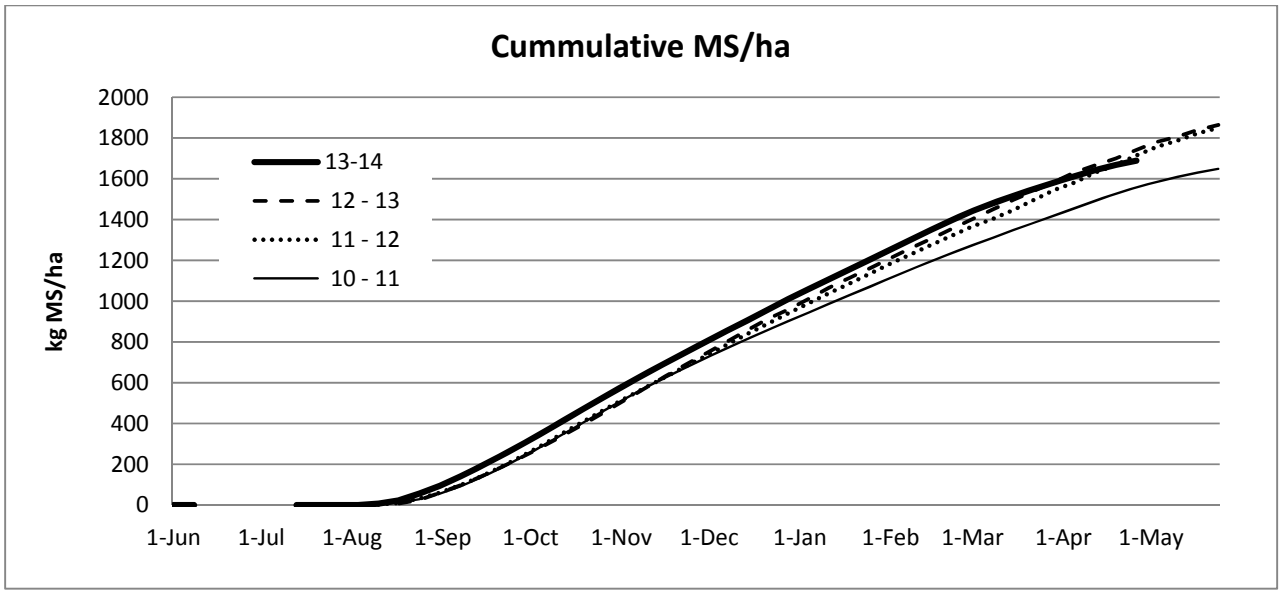




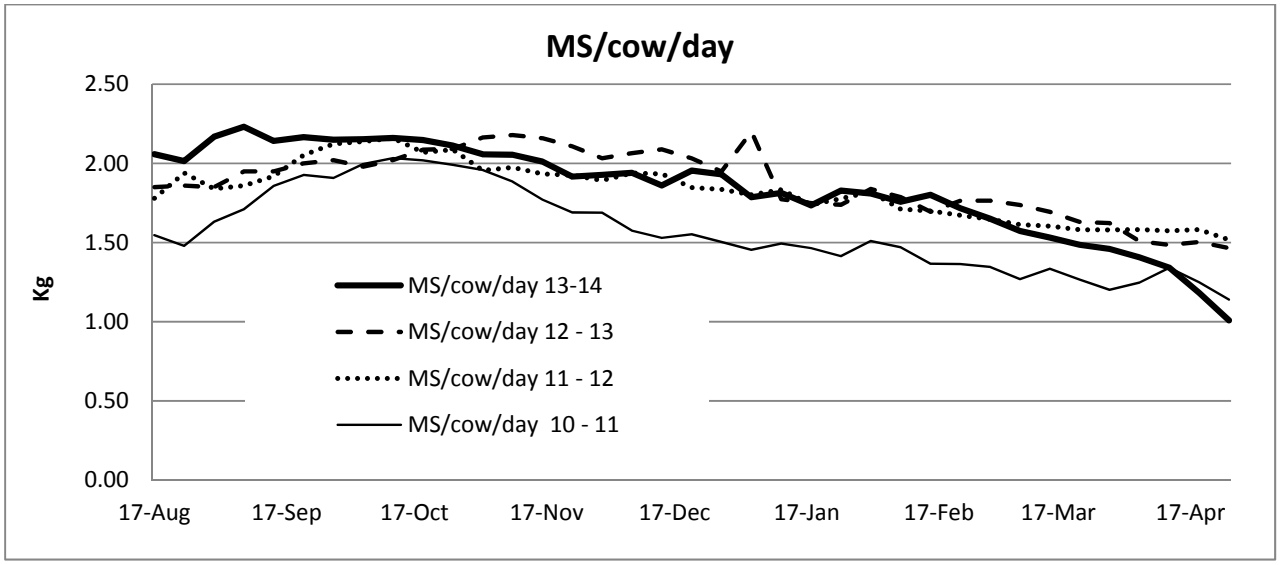


Production

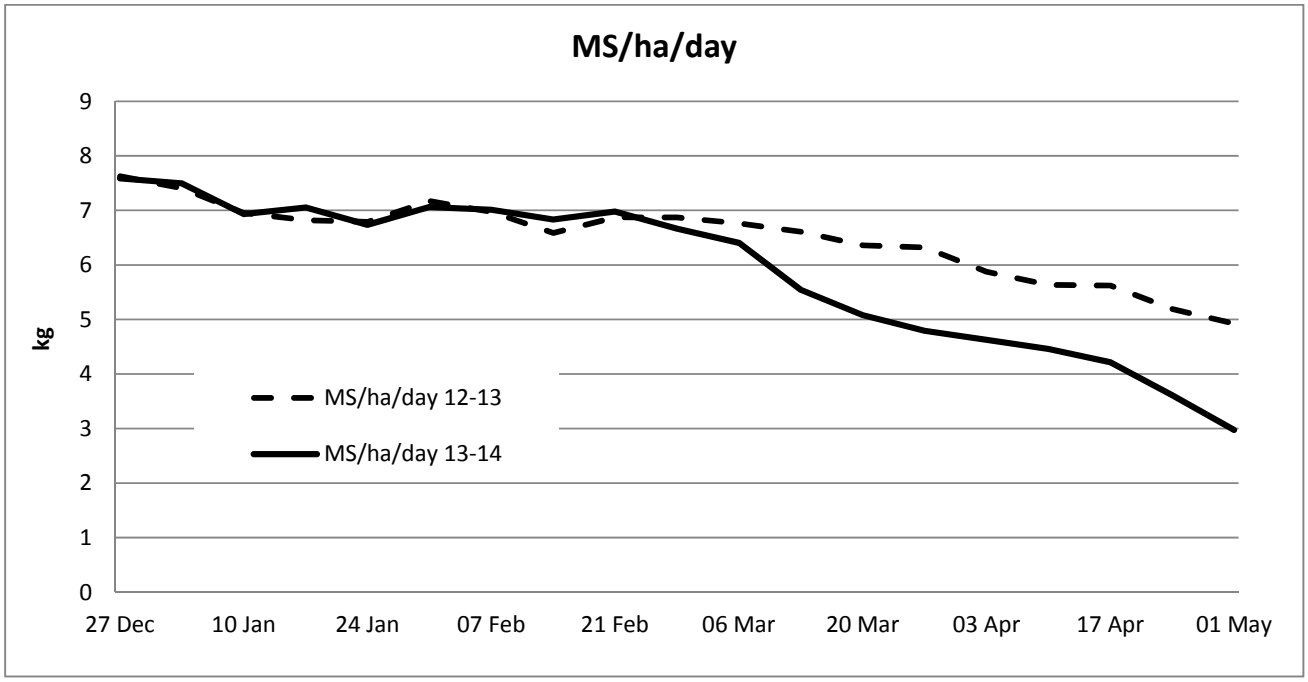
As a consequence of the season but more particularly because of the many changes we have had to make in order to comply with the LWRP, milk production has gone from higher than ever to a state where we will now produce considerably less milk solids than last season.

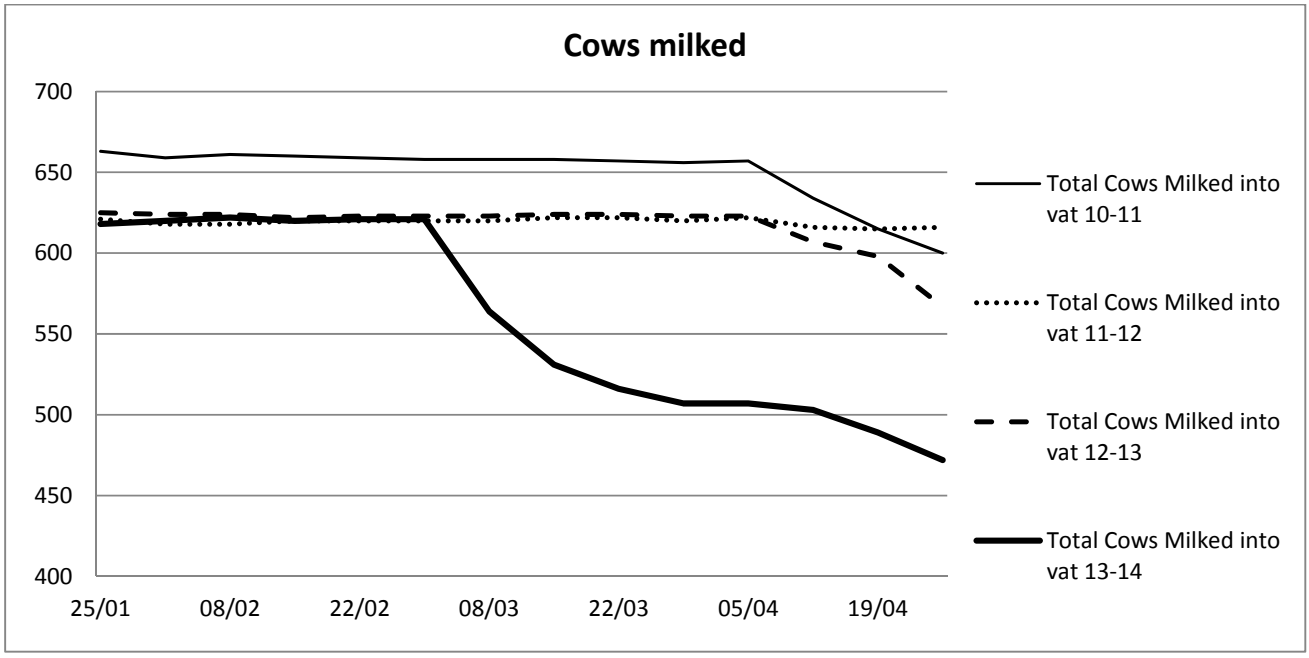


Per cow production has really fallen away from expected [historical 12-13] levels since February.



We have continually dropped cow numbers since March in an attempt to feed the herd well enough to gain dry-off condition scores, without using any supplement.

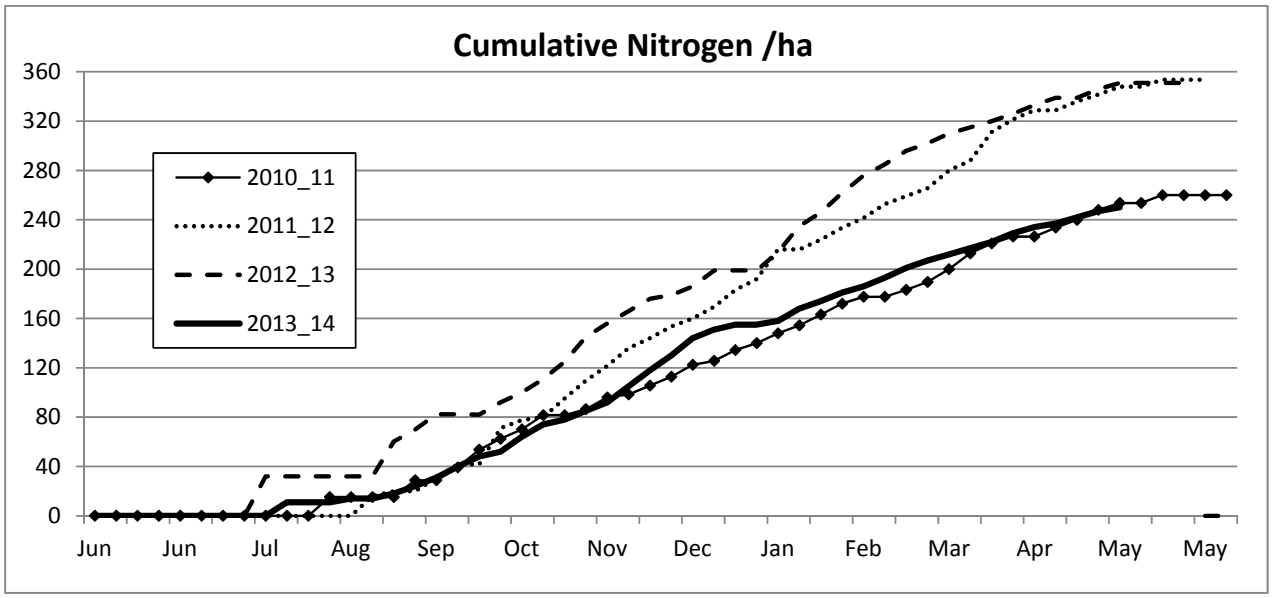




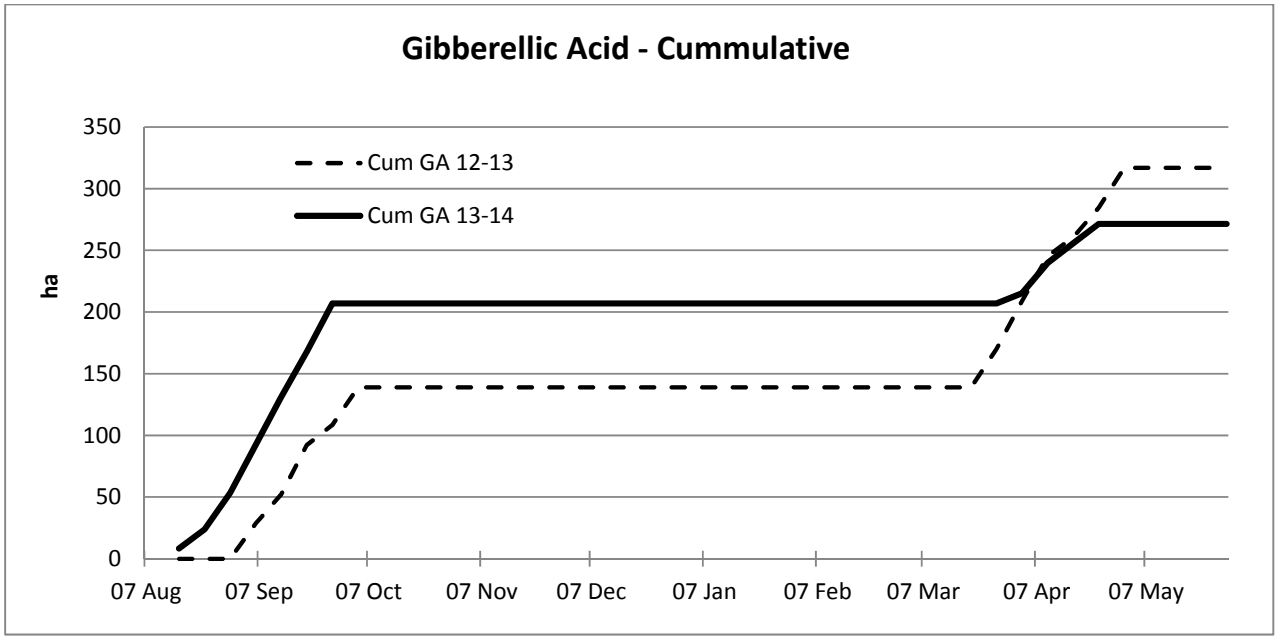
This has had a major impact on daily MS production.

Pastures

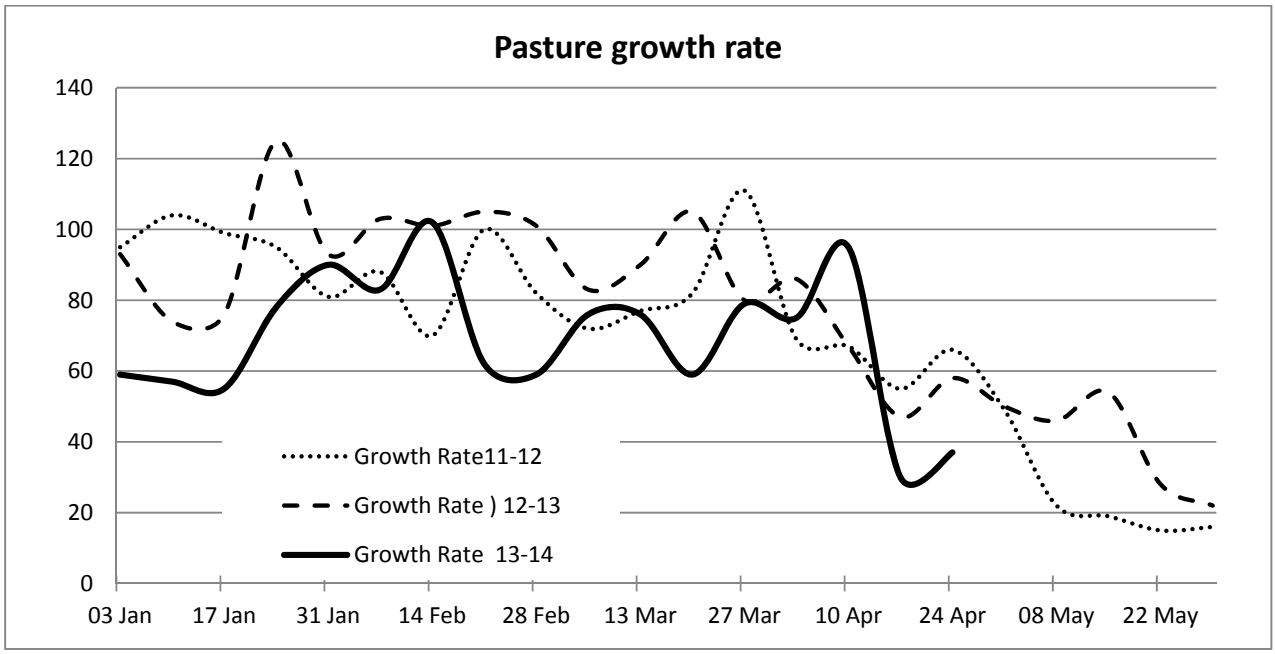
We have finished N applications for the season, and as planned, will use 250kg N/ha.



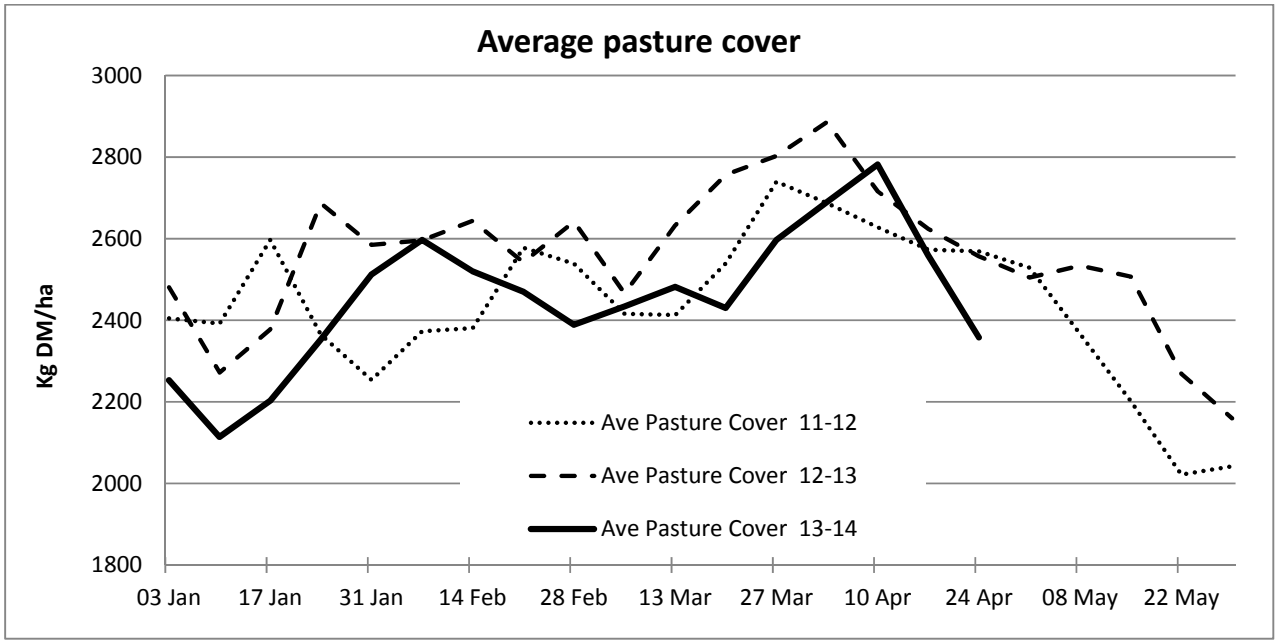
We have finished GA applications a little earlier than planned because of very wet ground conditions during the window of use [second to last grazing round].



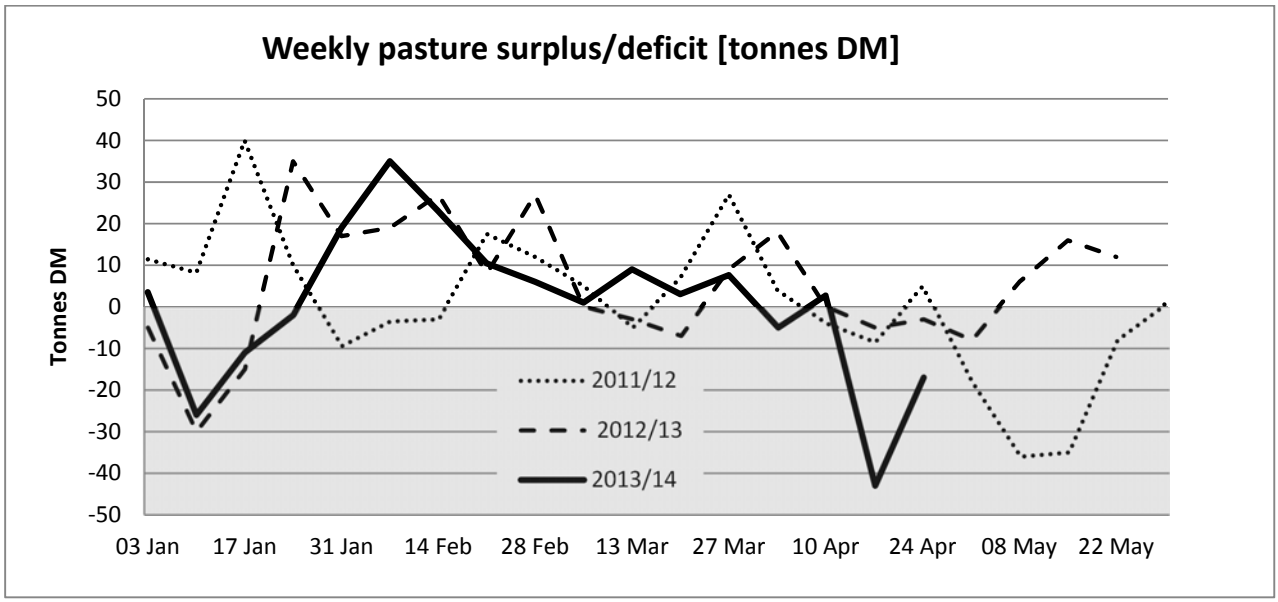
Measured pasture growth rate has fallen away in April possibly due to wet conditions.

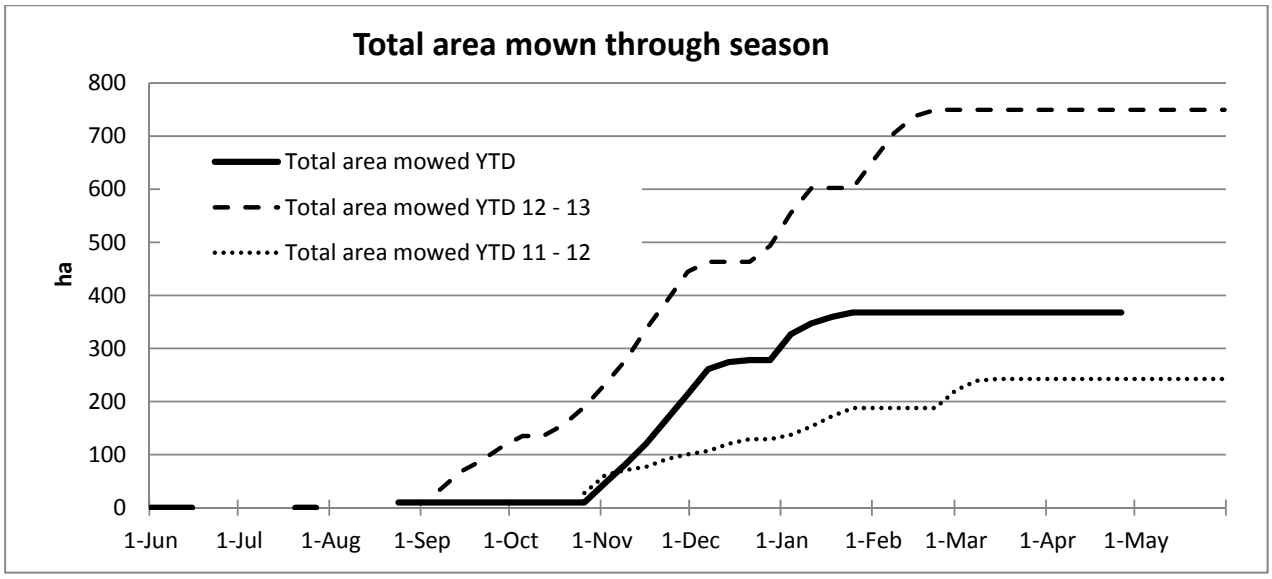


APC has fallen as well, we have managed APC with cow numbers [decreasing feed demand]. All cows on the platform are being fed as well as they can be within our grazing rules.



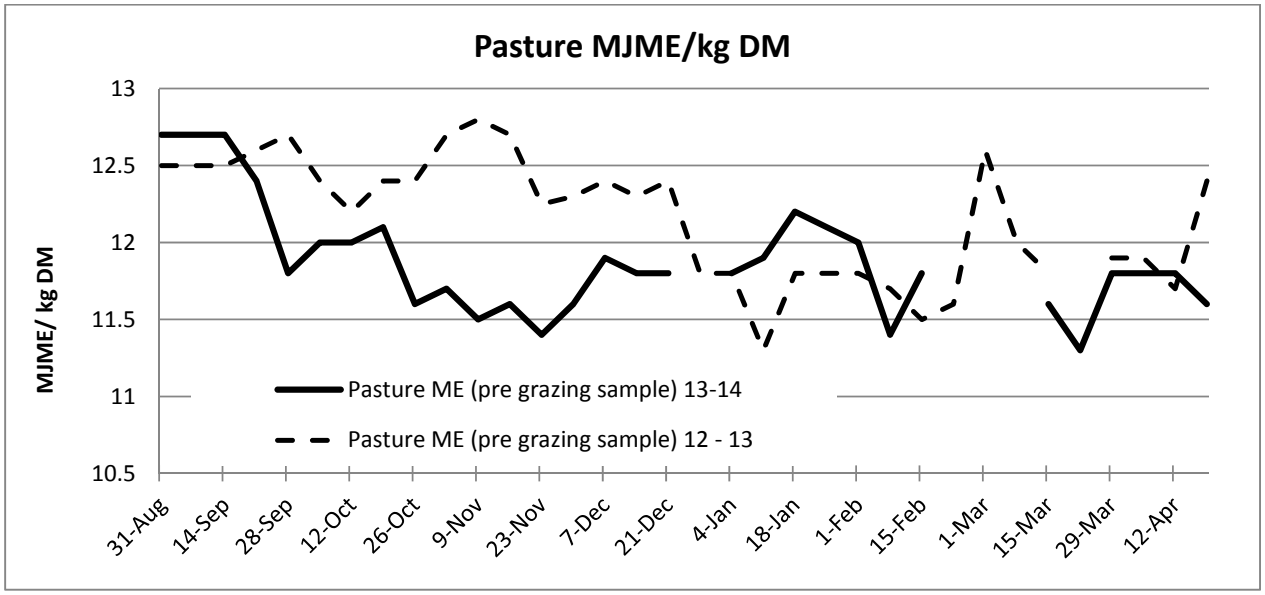
We have seen some large feed deficits and very variable weekly pasture growth rates this autumn.

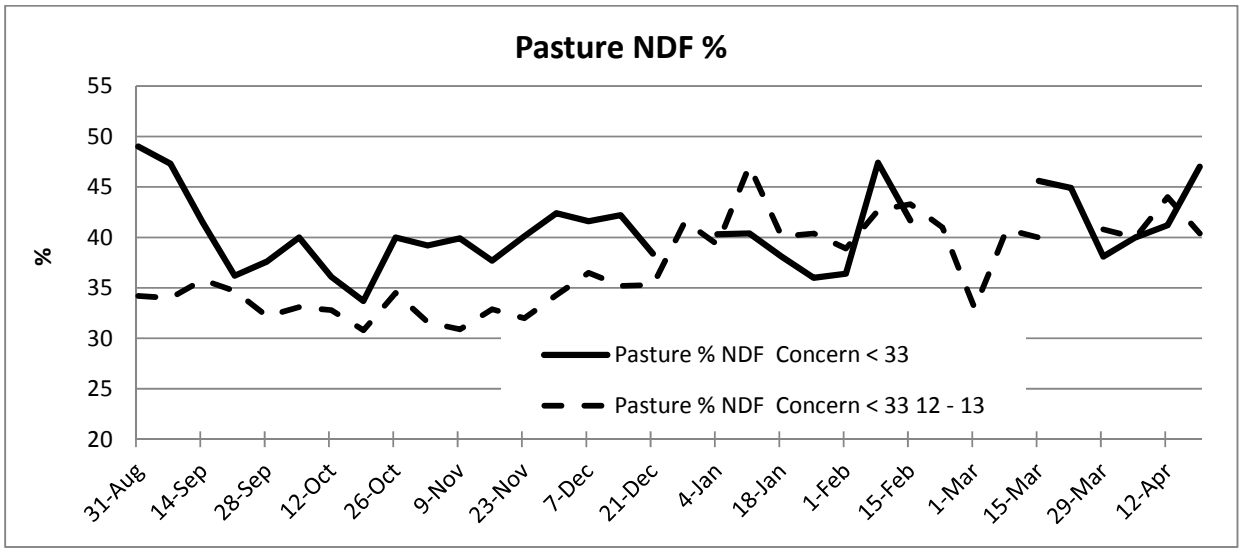




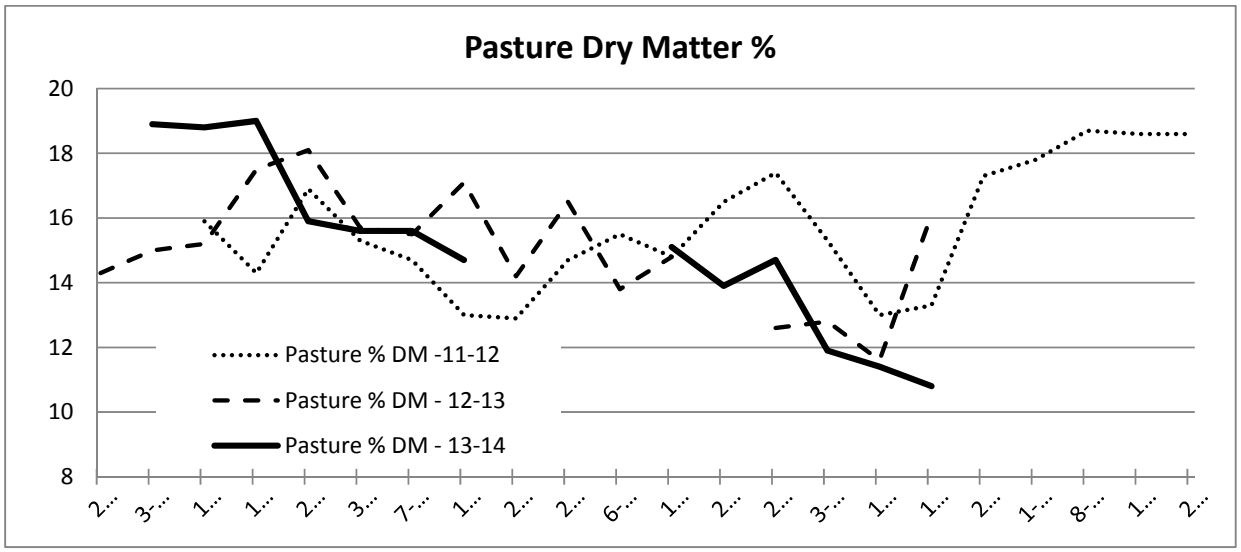
Pasture quality

We have seen pasture energy levels persistently lower than 12 ME through most of the season. However this is broadly in line with what happened last season. NDF has also been comparable.



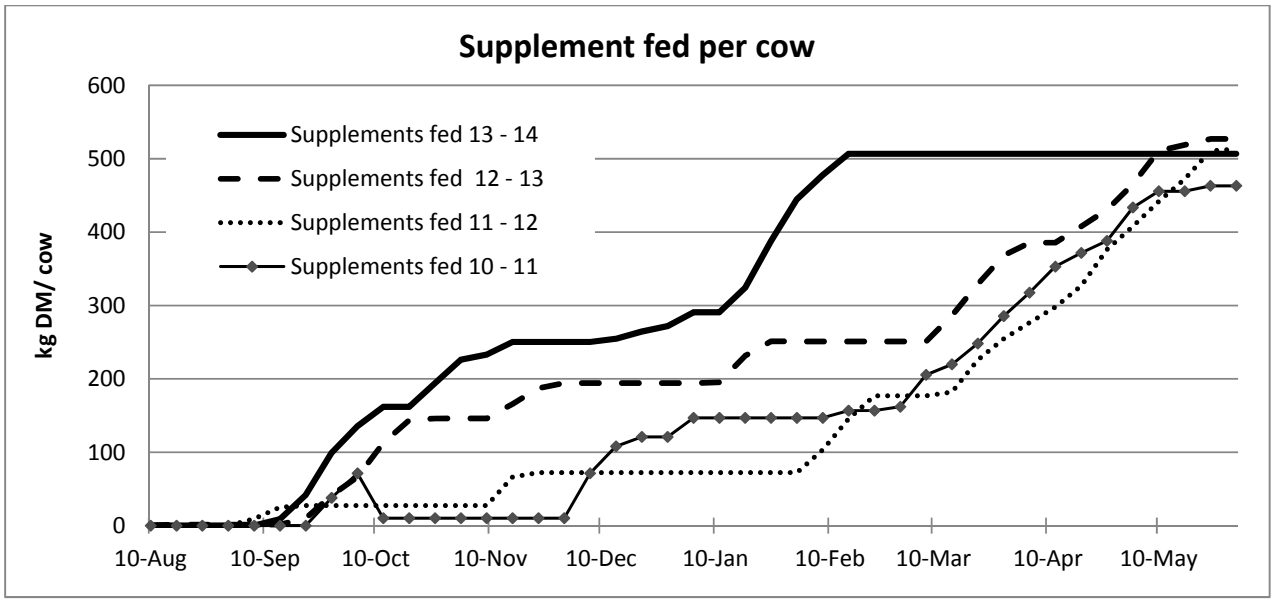


Pasture dry matter has been lower and has continued to decline this season. This may be impacting on cow condition, especially as we are running a pasture only feeding system. Furthermore the very low [down to 10.8 % average over 2 samples taken on the same day in late April], will be causing an overestimate in our measured pasture cover and growth.

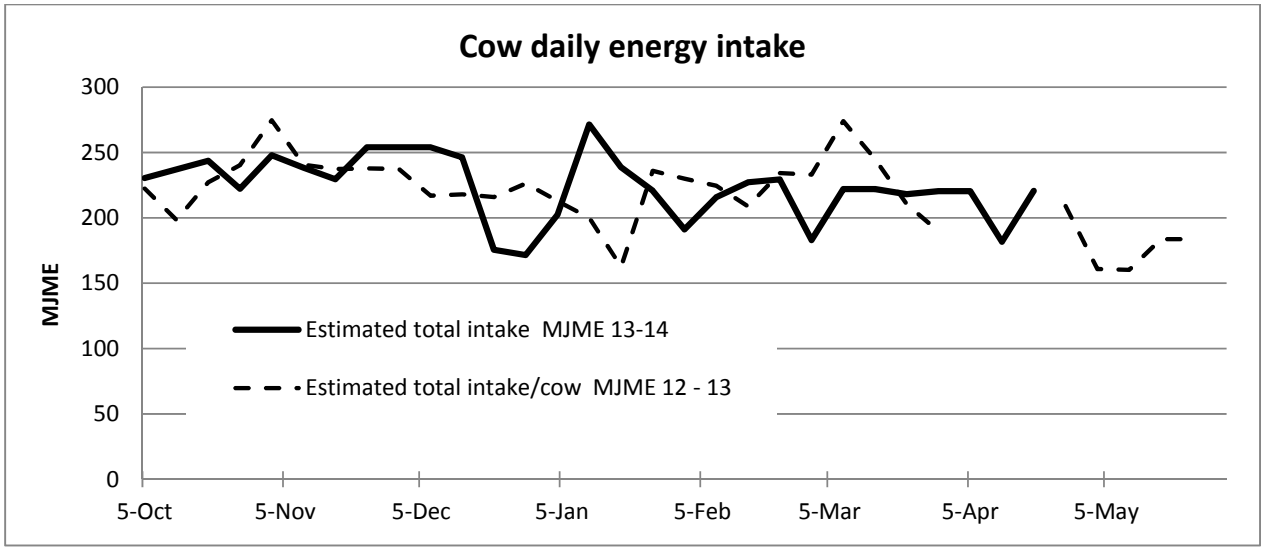


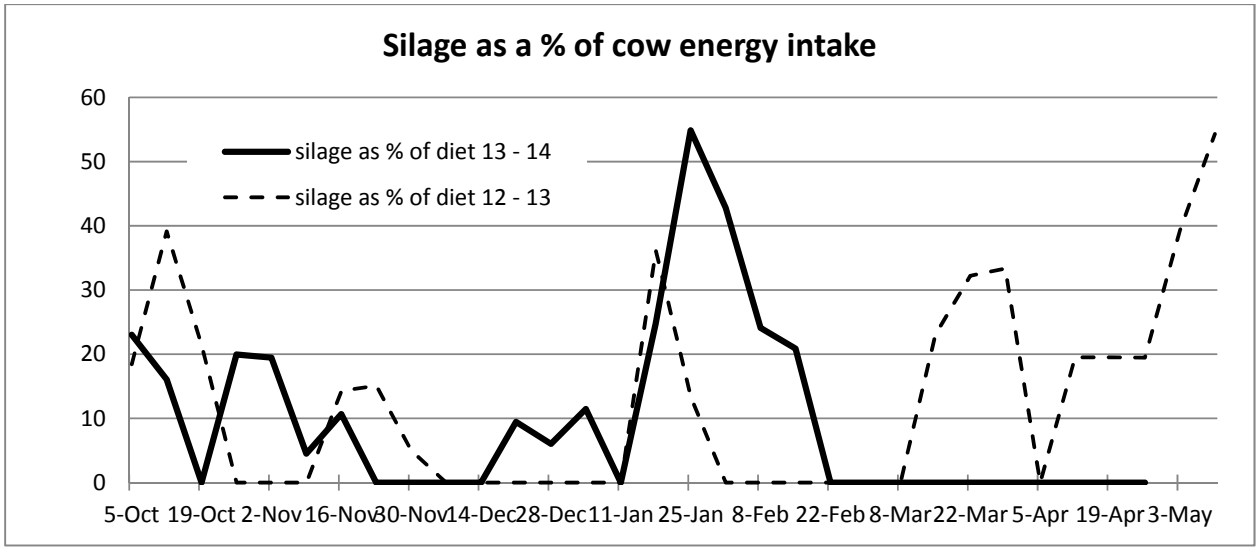
Supplements

As discussed earlier we have fed no supplement since mid February. This is a major change for LUDF as it normally depends on balage to extend the round and to carry cows later into the season whilst gaining body condition and supporting MS production.

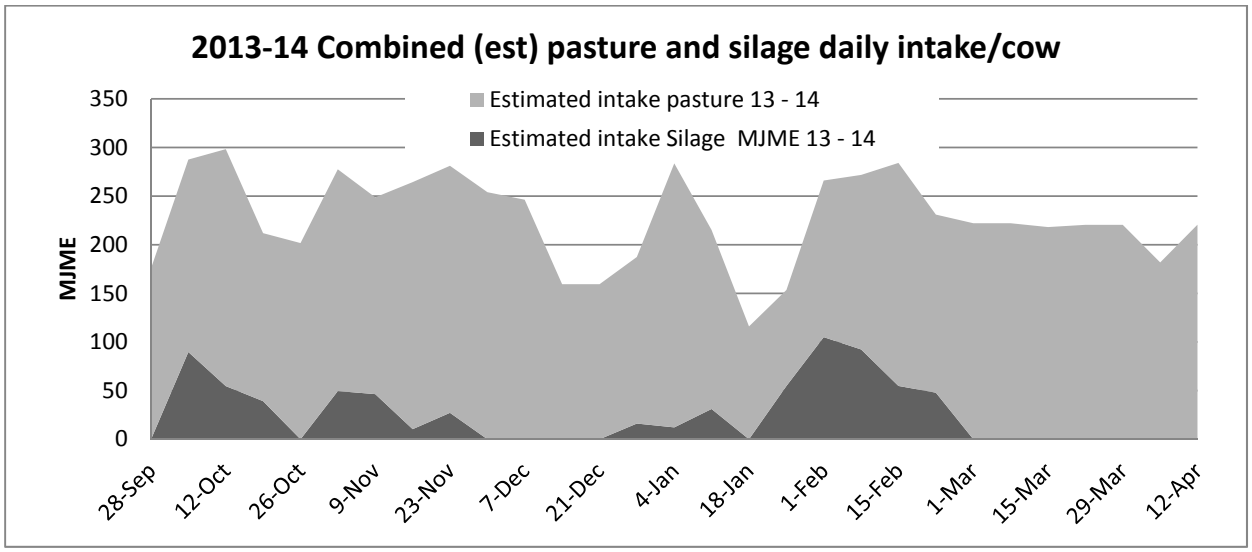


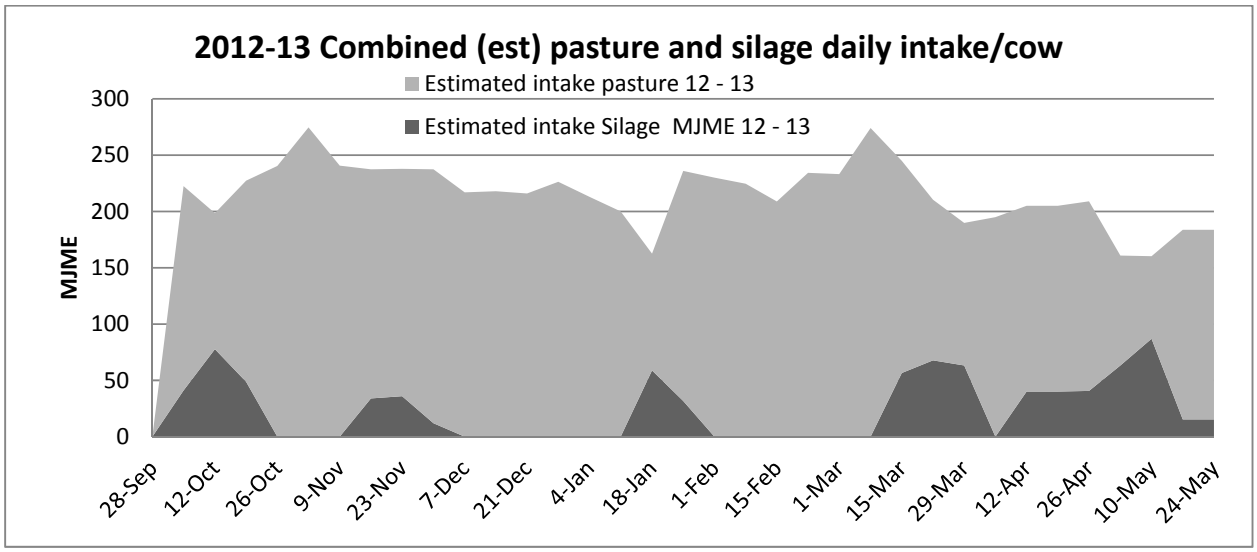
Estimated cow energy intake is apparently quite similar to last season. There is some doubt around this given the poor BCS progress and the need to dry off over 100 cows earlier than last season.





The two charts below show how silage and pasture have been used in the last 2 years.



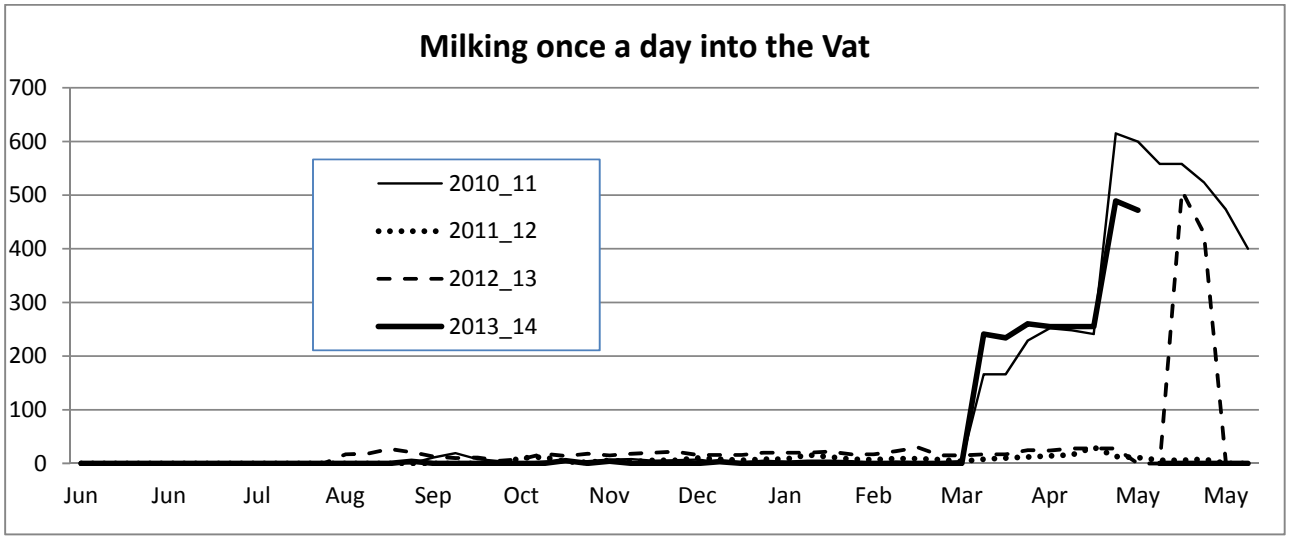


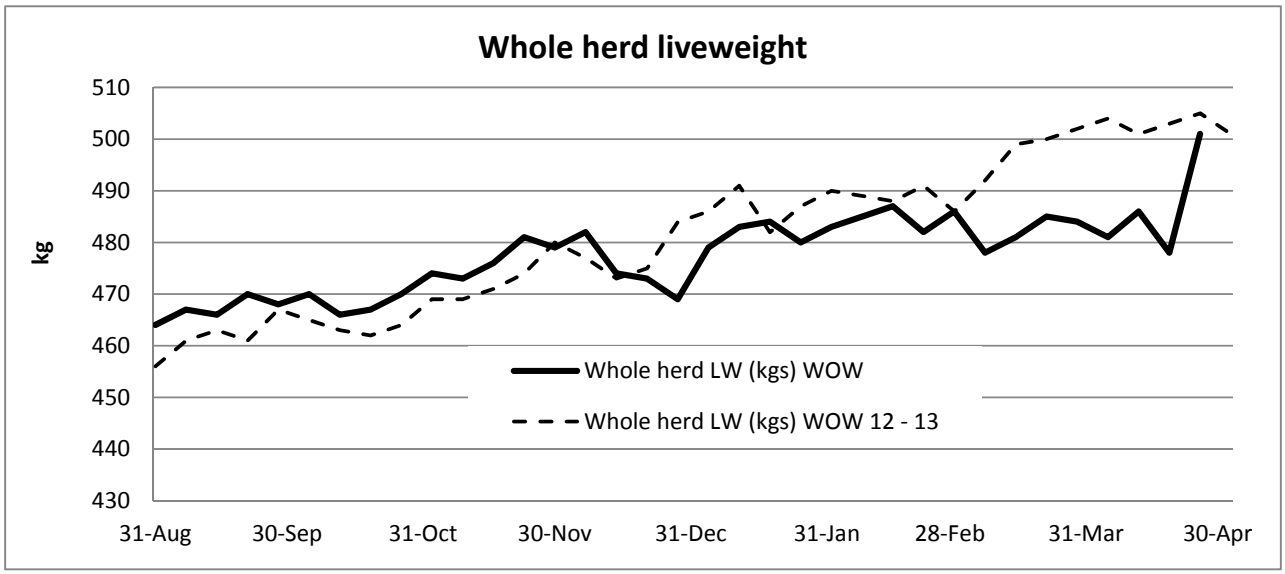
Cow numbers liveweight and body condition

Part of the herd [low BCS early calving cows] were put on once a day milking in the first week of March, this was followed by the whole herd going OAD in the third week of April.

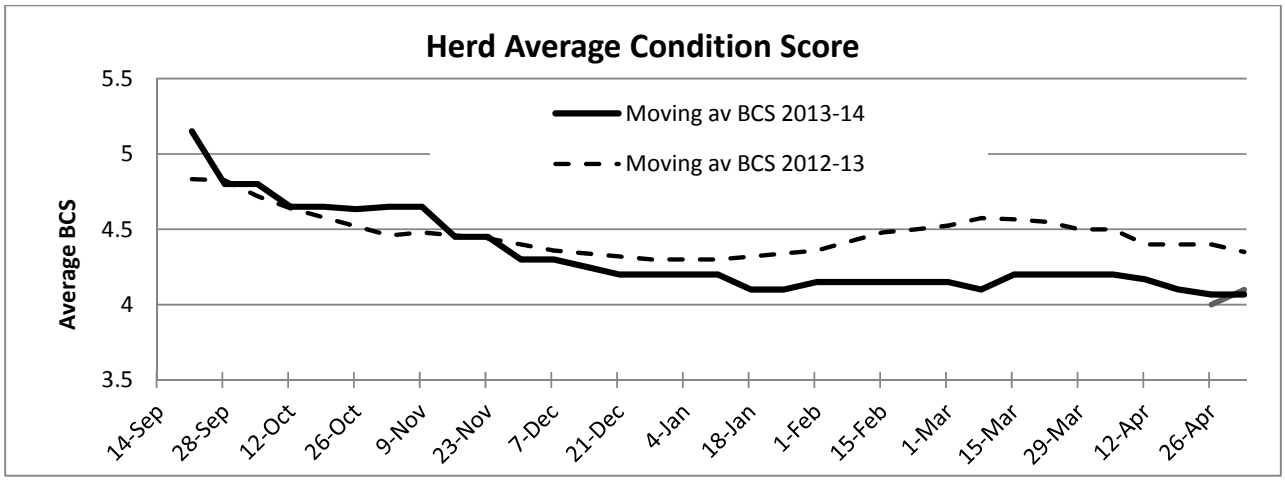
To drop numbers we also sold all empties and know culls in early March. By the end of April total days in milk was 240 compared to 253 at the same time last season.

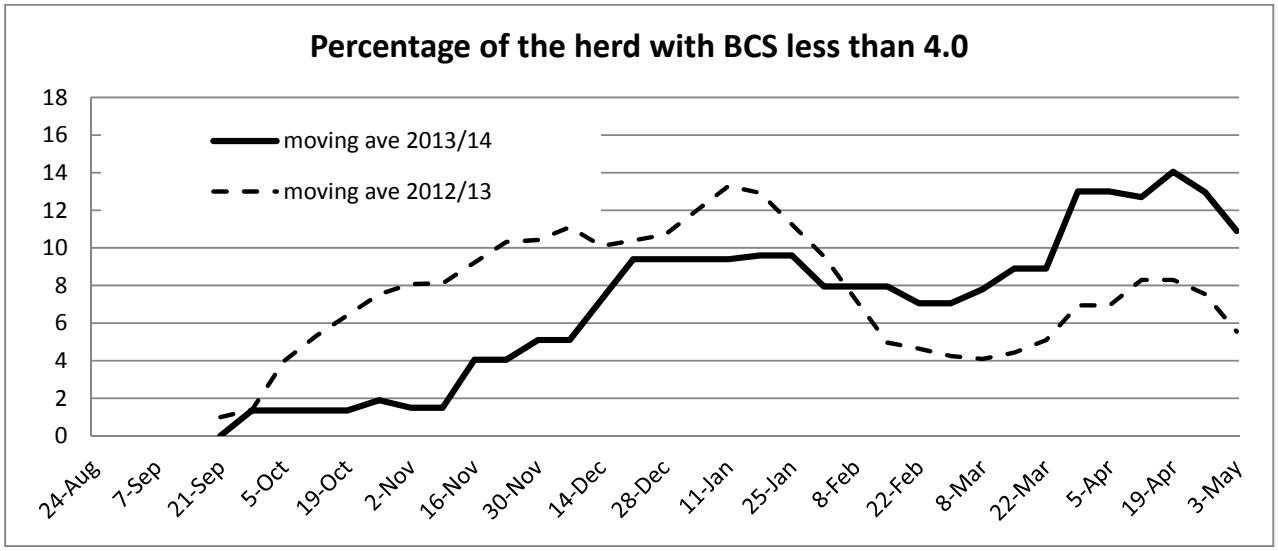
Liveweight has been very slow in gaining this autumn. The actual final weight for cows shown below for 13-14 is possibly not representative as over 100 more [light condition] cows were dried off.





Getting body condition score has been very difficult this Autumn, with more low BCS cows.





Pasture renewal

This season we have continued our policy of renewing 15% of pastures: 3 paddocks, N9, S4 and N7 were renewed with a mix of Tetraploid ryegrass [Bealey], diploid ryegrass [Trojan] and well as 2 white clovers, chicory and plantain. We have decided to go with 2 types of ryegrass in pastures as it seems to give good ground cover to compete with *poa. sp* grass weeds whilst still giving cows the grazing benefits of tetraploid ryegrass.

In late August / early September we elected to undersow 2 Shogun [hybrid tetraploid ryegrass] paddocks N3 and N5 because they were thinning out. We drilled shogun again in both paddocks and added chicory and plantain into N3 which has been evident this summer.

In April we under sowed N8, our first diverse pasture [ie with chicory and plantain] with 15kg/ha Trojan ryegrass because the ryegrass establishment was not satisfactory. This was considered to be due to competition from the herbs. Since then we have reduced our chicory and plantain seeding rate from 1.5kg/ha to 1kg/ha of each and believe this is giving a better distribution of ryegrass while maintaining a significant level of chicory and plantain

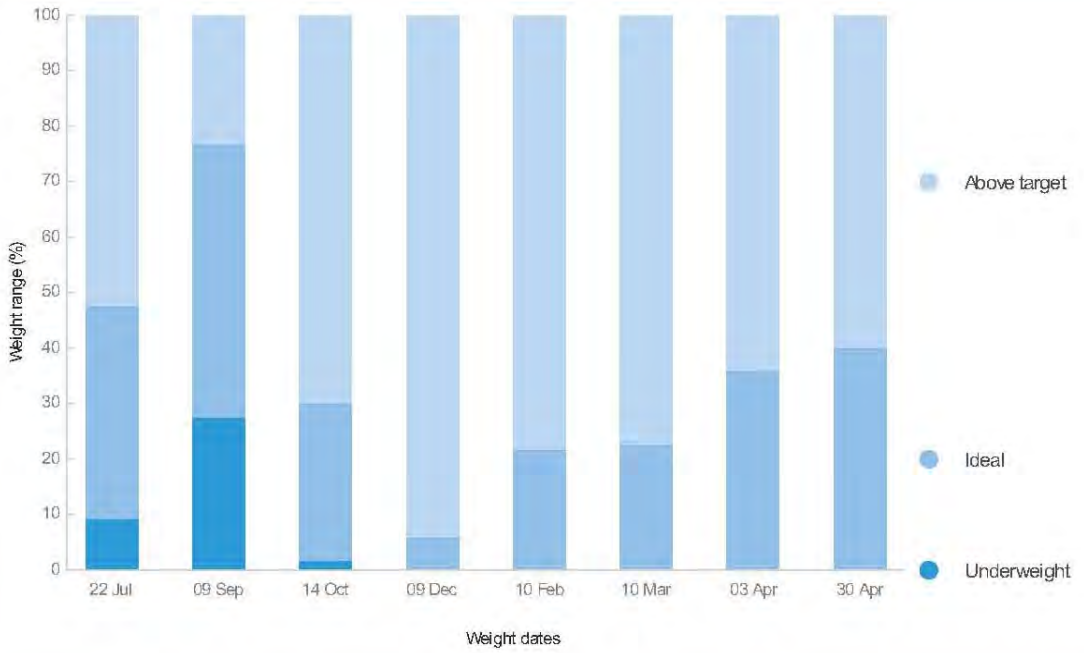
In April we also sprayed out and direct drilled N6 with Shogun ryegrass at 26kg/ha. This is one of the few remaining Bronsyn / Impact paddocks on the farm from conversion and the paddock has performed very poorly this season. By doing this we accept that we will not have this paddock available for a final grazing later this May, but the benefit of better performance next season will justify this expense. Due to programmed regrassing work elsewhere on the farm it was not likely this paddock would be regressed till the 2015/16 season, hence the use of Shogun for the next 18 months.

Since the initial establishment of diverse pastures in N8 in January last year (2013), LUDF now has chicory and plantain in 5 of the 21 paddocks (24% of the farm).

Heifer Liveweights

Ranges for 2012 Spring as at 30/04/2014

Weight ranges



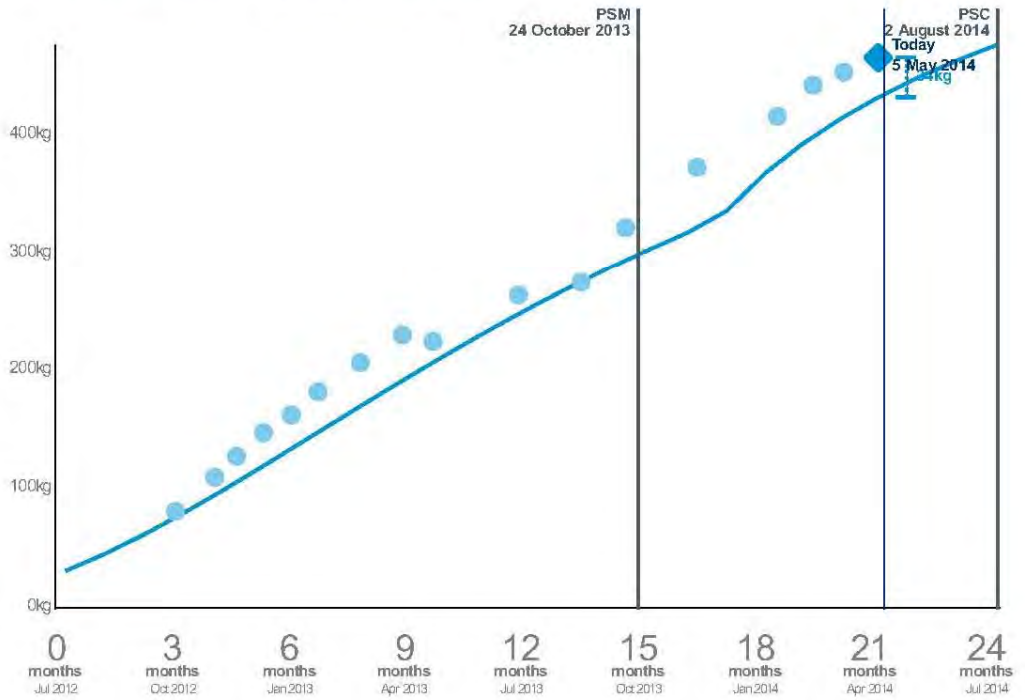
Range	July 2013		September 2013		October 2013		December 2013		February 2014		March 2014		April 2014		April 2014	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Above target	63	52.5	28	23.3	84	70	113	94.2	94	78.3	93	77.5	77	64.2	72	60
Ideal	46	38.3	59	49.2	34	28.3	7	5.8	26	21.7	27	22.5	43	35.8	48	40
Underweight	11	9.2	33	27.5	2	1.7	0	0	0	0	0	0	0	0	0	0
Total animals	120		120		120		120		120		120		120		120	

LIC

Overview of 2012 Spring as at 30/04/2014

Young stock trend

All 120 animals in this weighing are displayed

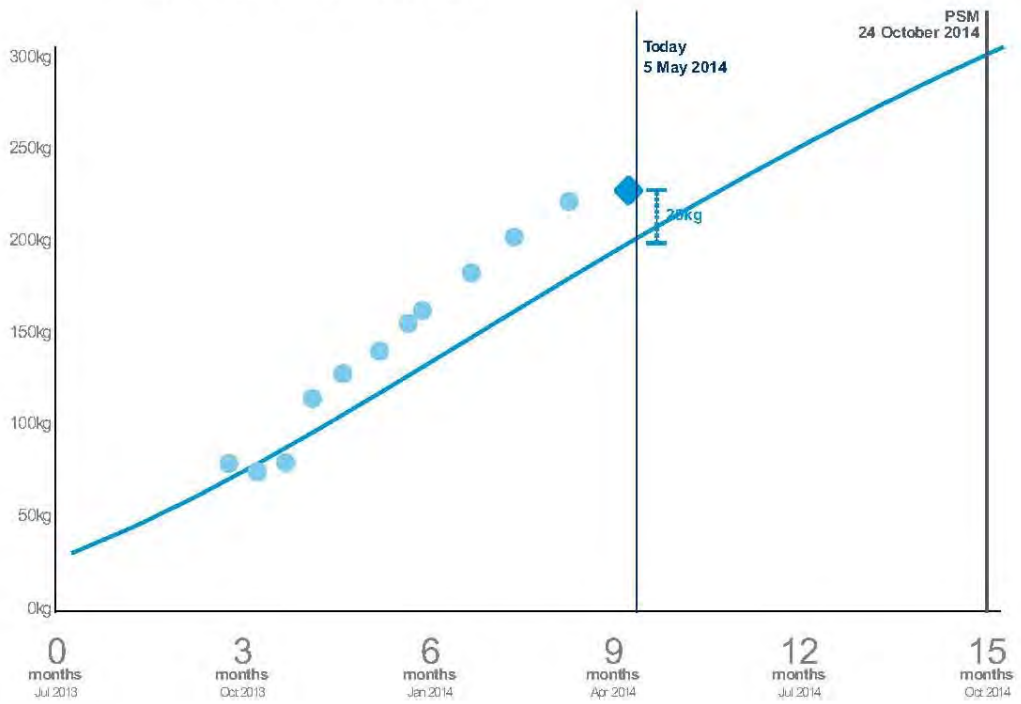


LIC

Overview of 2013 Spring as at 1/05/2014

Young stock trend

All 150 animals in this weighing are displayed



LIC

LUDF Farm Walk Notes

Tuesday 6th May 2014

Critical issues for the short term

1. **Manage feed supply and pasture quality on the platform and respond quickly to changing growth rates.**
2. **Keeping all cows especially early calving light condition cows well fed to achieve required cow condition at calving.**
3. **Achieving target grazing residuals.**
4. **Getting autumn cow condition scoring done to make decisions on dry-off dates based on individual cow BCS and calving date.**

Herd Management

1. All cows are now being milked once a day as we are not seeing much an improvement in our herd body condition. We have now dried off 151 low BCS early calving cows. There are now a total of 358 cows milking into the vat this morning. There are 6 treatment cows.
2. We have made some significant changes this autumn to enable the milking platform to stay within its historical Nitrogen load this season and to comply with the intent of the (ECAN) Land and Water Regional Plan.
3. We will keep monitoring cow condition and we will continue to use our drying off decision rules as presented below. Using these rules below will result in us drying off 99 cows tomorrow. About 7 of these cows will be dried for low production. Given the wetness of the farm, poor cow condition and the fall in pasture cover we will review this next week and may dry off more cows over the next 10 -14 days.
4. Below is our decision making framework for drying cows off:

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.

Feeding the remaining 256 cows 18kgDM/cow/day requires a growth rate of 30kg DM/ha/day; the stocking rate will now be 1.7 cows/ha (based on the available 153ha). The demand line in the feed wedge below is calculated on this basis. In essence LUDF is choosing to balance feed supply and demand by reducing demand, rather than increasing supply through importing more silage (with the subsequent additional N brought onto the platform). If

the farm does dry out and we grow enough feed we will bring some dry cows back onto the platform for a short time during May prior to them going to their winter graziers [they are currently on a small block near the farm].

5. We have had 4 new cases of mastitis and 4 new lameness cases this week.
6. Average bulk milk SCC was 344.
7. Average daily milk solids production per cow (all cows milked into the vat) is 1.11kgMS/cow, 0.1 kg/ cow/day more than last week. Daily production per hectare was 2.47 kg MS/ha (vs 2.97 kgMS/ha last week).

Growing Conditions

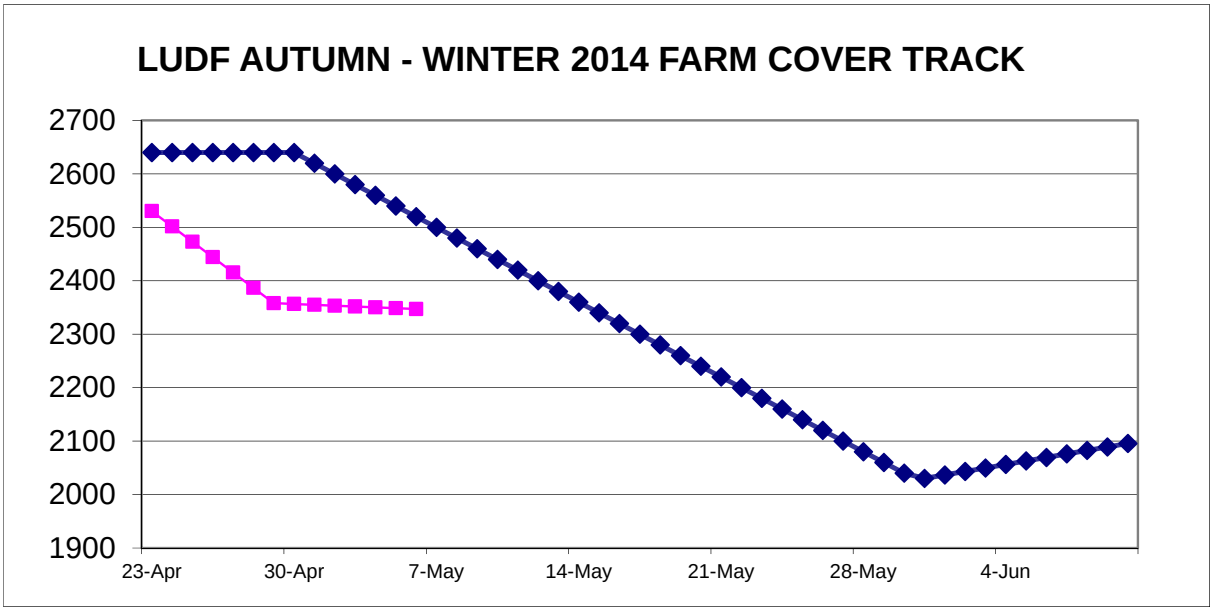
8. 9 am average soil temperature was 9.8 degrees 1.3 degrees cooler than last week.
9. The farm had 31 mm rain over the week.
10. Soil temperature and soil moisture graphs follow showing soil temperature over the last 2 weeks and impact of the rain and Southerly weather and then the improvement over the last few days with norwest winds.

Pasture Production and Management

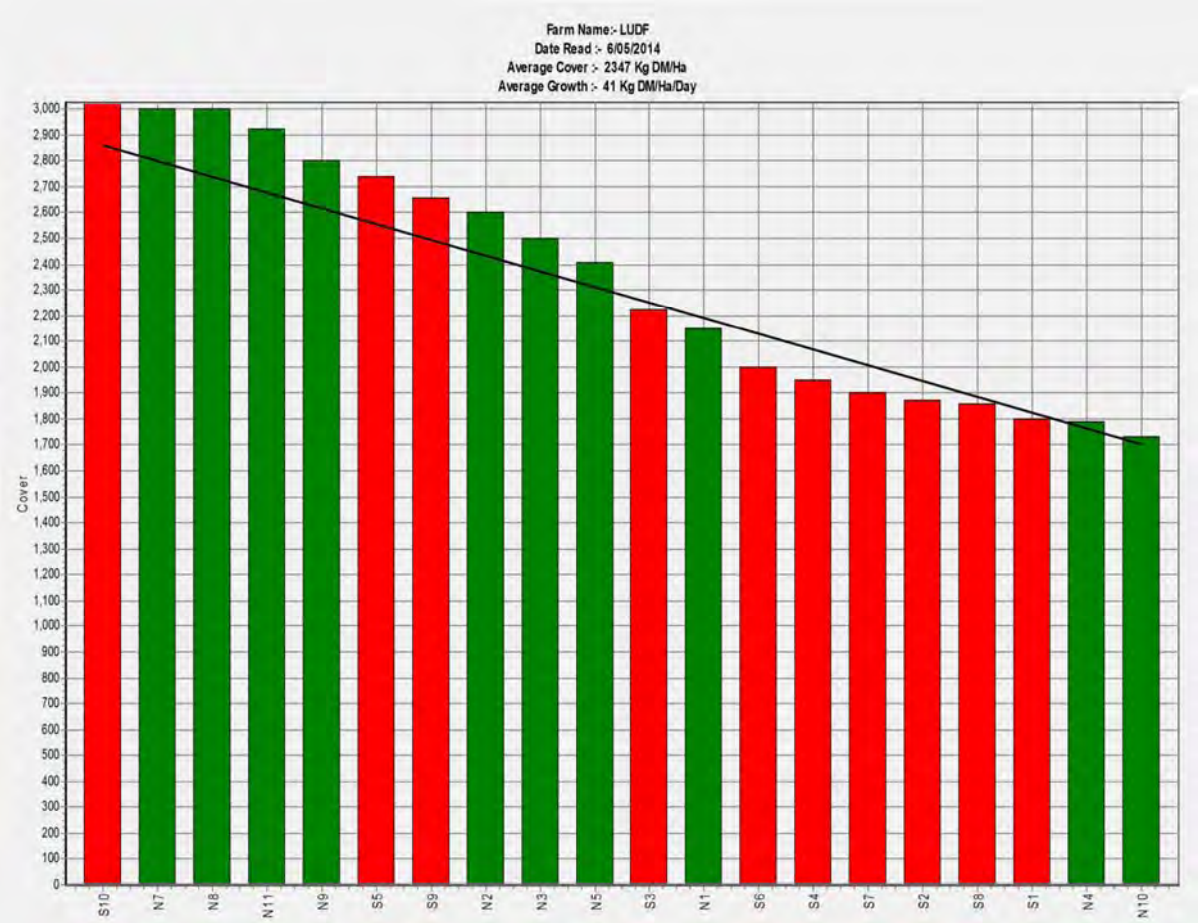
11. This weeks measured average pasture cover is 2347 kgDM/ha down 11kg DM/ha, from last week. Our estimated average daily pasture growth rate for the last week has been 41 kg DM/ha. The farm currently has a predicted surplus of 9.7T DM after drying off 102 cows in the next day.
12. This last week we have had to accept some higher grazing residuals due to the very wet ground conditions.
13. The round length was 36 days this week [from 35]. No silage has been fed this week.
14. We have undersown N8 which is our first diverse pasture [with chicory and plantain], it got 15kg /ha Trojan diploid ryegrass as the ryegrass establishment was not as good as expected. The seed seems to have struck well. We have sprayed and direct drilled paddock N6 with Shogun and clover [26 kg/ha] as this original Bronsyn impact pasture has performed very poorly this season. By doing this we accept that we will not have this paddock available for a final grazing at the end of the season, but the benefit of better performance next season justify this.
15. No nitrogen [urea] applied this week. We have now finished for this season and gives us a total of 250Kg N/Ha
16. No gibberellic acid applied this week. We will not be applying any more this season.

Feeding Management

17. We have fed no silage this week.
18. No mowing has occurred over the last week.
19. Below is our Autumn Winter Farm average pasture cover track, the budgeted track is how we would normally plan to run the farm. This season as can be seen from the notes we will balance feed supply [APC] by adjusting cow numbers. However we will still manage the farm to end May with an average cover of 2050 kg DM/ha.



20. This week's wedge is printed below. This is the wedge given the intended reduced cow number that will have tomorrow.



Herd Management and Mating

21. The herd was body condition scored last week, average was 4.1 and 9.8% were below BCS 4.0 these are not as good as we would like and it is a big concern that we are not making progress with BCS. We have decided to dry off 102 cows tomorrow based on their BCS and calving date and will look at drying off more cows next week. We had expected the average BCS to have started to trend upwards.

22. It is difficult to tell what progress is being made on cow liveweight as group make up has changed a lot lately [see data sheet below].

Data sheet

LUDF Weekly report	15-Apr-14	22-Apr-14	29-Apr-14	6-May-14
Farm grazing ha (available to milkers)	160	160	160	160
Dry Cows on farm / East blk /Jackies/other	0/2/0	0/19/0	0/40/0	0/0/151
Culls (Includes culls put down & empties)	0	0	0	0
Culls total to date	132	132	132	132
Deaths (Includes cows put down)	0	0	0	0
Deaths total to date	5	5	5	5
Calved Cows available (Peak Number 630…)	510	493	472	361
Treatment / Sick mob total	7	5	2	6
Mastitis clinical treatment	5	0	2	4
Mastitis clinical YTD (tgt below 64 yr end)	81	81	83	87
Bulk milk SCC (tgt Avg below 150)	237	200	269	344
Lame new cases	2	3	2	4
Lame ytd	122	125	127	131
Lame days YTD (Tgt below 1000 yr end)	755	0	790	818
Other/Colostrum	0/0	0/0	0/0	0/0
Milking twice a day into vat	168	0	0	0
Milking once a day into vat	335	489	472	357
Small herd	168	0	0	0
Main Herd	335	489	472	357
MS/cow/day (Actual kg / Cows into vat only)	1.34	1.17	1.01	1.11
MS/cow to date (total kgs / Peak Cows 632	417	0	429	433
MS/ha/day (total kgs / ha used	4.22	0.00	2.97	2.47
Herd Average Cond'n Score	0.00	4.00	0.00	4.10
Monitor group LW kg WOW 347 early MA calvers	485	0	497	0
Soil Temp Avg Aquaflex	13.8	12.9	11.1	9.8
Growth Rate (kgDM/ha/day)	0	30	0	41
Plate meter height - ave half-cms	-3.6	14.7	-3.6	13.2
Ave Pasture Cover (x140 + 500)	0	2559	0	2347
Surplus/[defict] on feed wedge- tonnes	0	[43]	0	9.7
Pre Grazing cover (ave for week)	3638	3700	3626	3087
Post Grazing cover (ave for week)	1800	1750	1800	1800
Highest pregrazing cover	3800	3700	3824	3356
Area grazed / day (ave for week)	5.00	4.00	4.40	4.20
Grazing Interval	31	38	35	36
Milkers Offered/grazed kg DM pasture	18.7	0.0	0.0	0.0
Estimated intake pasture MJME	221	0	0	0
Milkers offered kg DM Grass silage	0	0	0	0
Silage MJME/cow offered	11	0	0	0
Estimated intake Silage MJME	0	0	0	0
Estimated total intake MJME	221	0	0	0
Target total MJME Offered/eaten (incl. 6% waste)	0	0	0	0
Pasture ME (pre grazing sample)	11.8	0.0	0.0	11.7
Pasture % Protein	20.4	0.0	0.0	21.8

Pasture % DM - Concern below 16%	11.4	0.0	0.0	14.0
Pasture % NDF Concern < 33	41.2	0.0	0.0	42.4
Mowed pre or post grazing YTD	0.0	0.0	0.0	0.0
Total area mowed YTD	367.7	367.7	367.7	367.7
Supplements fed to date kg per cow (630 peak)	506.8	506.8	506.8	506.8
Supplements Made Kg DM / ha cumulative	0	0	0	0
Units N applied/ha and % of farm	25units/19%	25units/19%	25units/15%	0
Kgs N to Date (whole farm)	242	0	250	250
Rainfall (mm)	39	0	29	31
Aquaflex topsoil relative to fill point target 60 - 80%	90-100	100	100	100

Farm walks occur every Tuesday morning. 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 and gumboots. Phone SIDDC – 03 423 0022.

Management Group

Peter Hancox (Farm Manager), Steve Lee (Consultant).

LUDF Plan for 2014-15

The strategic objective for LUDF is:

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 addition, the proposed ECAN Land and Water Regional Plan - Variation 1 will require LUDF to operate at or below a specific N-loss to water target from 2017 and potentially at a lower N-loss level from 2022 onwards.

As a demonstration farm with the above objective, LUDF has determined it will seek to operate from now on, at lower N-loss than previously, to document how the farm can respond to these requirements, and the implications, costs and opportunities that may arise from this.

Considering the above objective requires LUDF to consider the whole catchment effect of meeting these requirements, not just the milking platform. Farms with their own support land may find opportunities to implement system changes that substantially lessen the nitrogen load on one part of the business, to enable other parts of the business to continue with less change.

Farms operating as milking platforms only, will benefit from understanding the implications of reducing nitrogen losses on land that supports their wintering, replacements and supplement supplies. Overlooking these changes increases the risk of reduced supply and / or higher cost for support land requirements.

Two clear pathways were evident for LUDF to reduce N-losses across the catchment:

1. Invest in infrastructure on-farm to reduce the grazing / standing time on paddocks
2. Reduce the number of animals required thus further reduce the demand for feed for maintenance of additional animals, while seeking higher production per cow to generate sufficient income and profit.

LUDF has chosen to implement a nil-infrastructure, low input model on the basis of emerging research from Pastoral 21 (P21) conducted at the Lincoln University Research Dairy Farm (LURDF). Three years of data from this farmlet study (see LUDF focus day handouts from July 2012 and July 2013) showed milk production levels of over 500kgMS/cow were achieved with 3.5 cows/ha, 160kgN fertiliser and less than 300kgDM imported supplement/cow. Profitability was calculated as comparable to LUDF with N-losses on the milking platform approximately 12% less than LUDF.

The P21 research had 2 farmlets with 29 or 34 cows, stocked at 3.5 or 5 cows per hectare. LUDF will largely replicate the same system in 2014-15 by upscaling this to the 160 ha LUDF milking platform.

Nil Infrastructure / low input farming system:

The essence of the system is influenced by two factors:

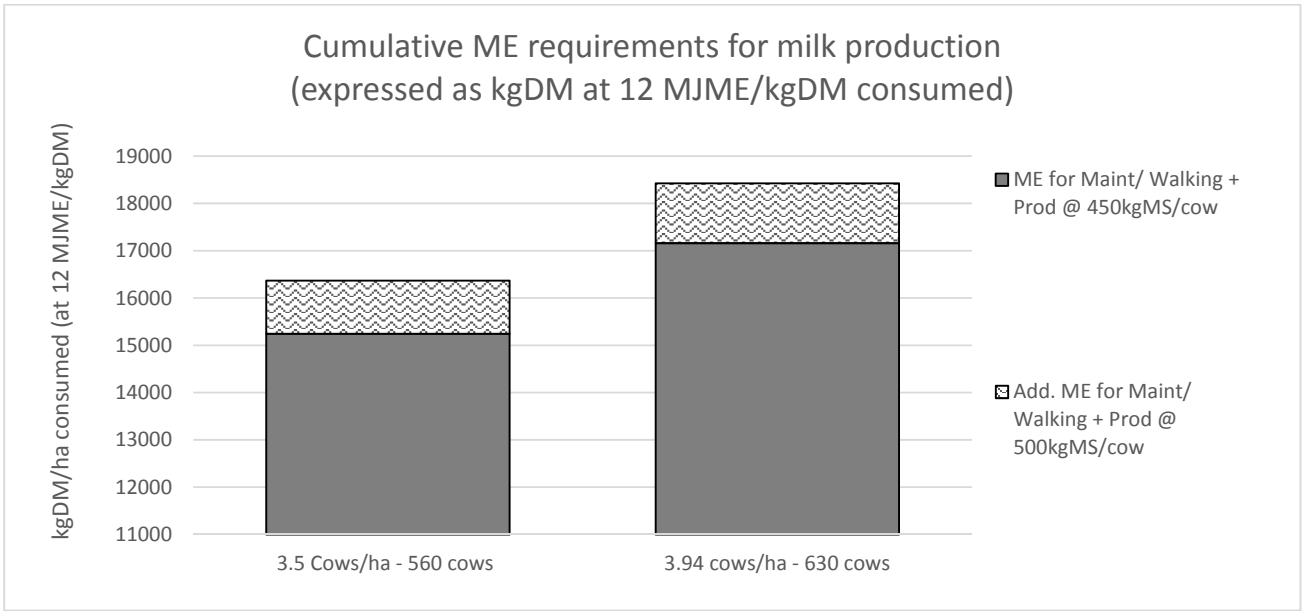
- Reducing the stocking rate as much as possible so that more of the total available feed is used in milk production (and less is required for maintenance of additional animals)
- Reducing the need for brought in feed and nitrogen fertiliser due to lower animal demand for a similar level of milk production.

Note this is a low input system, but not a zero input system. It is seeking to optimise the use of inputs including the farms potential pasture production without the use of any standoff / feeding pad / housing infrastructure.

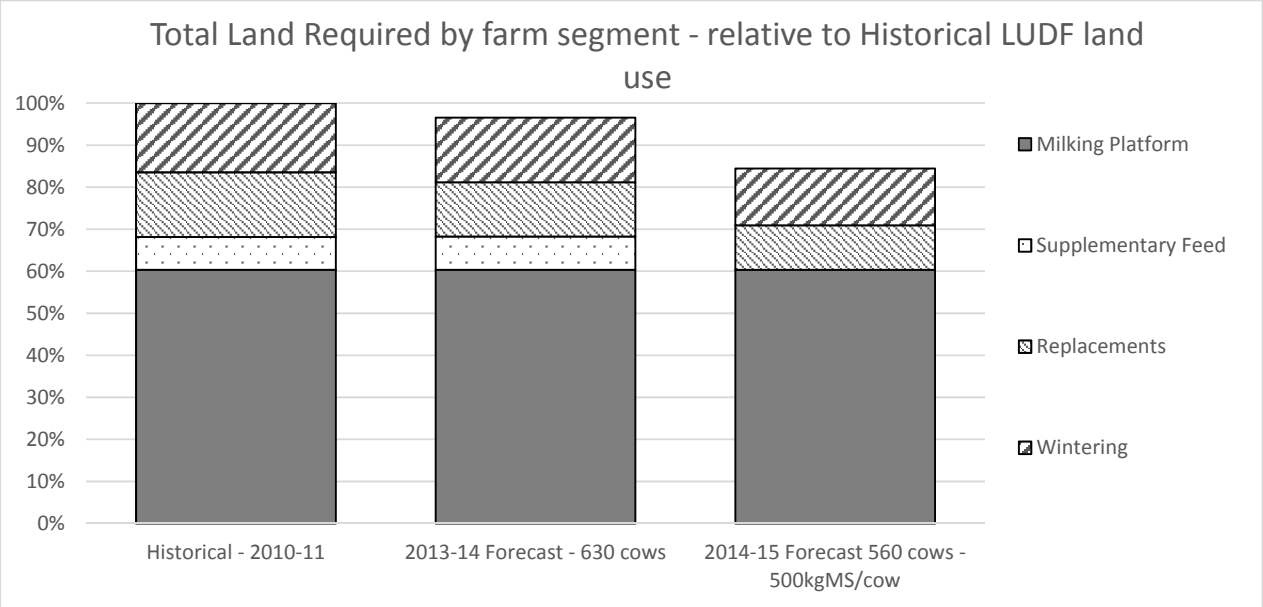
Matching stocking rate and feed supply.

LUDF contracted two outside parties to calculate likely profitability, production and N-loss from a nil-infrastructure / low input system. Both indicated stocking rates of 3.4 – 3.7 cows/ha with per cow production of 480-500kgMS/cow should be achievable and reduce N-losses. As the P21 research stocking rate / production results are in this range LUDF has determined to follow the same level of inputs and stocking rate to provide greater certainty between the results at LUDF and the research.

Calculating the feed supply required to achieve this level of milk production indicates 560 cows producing 500kgMS/cow should consume approximately 200,000MJME per hectare, or 16,400kgDM at 12 MJME/kgDM. This is less feed than required for 630 cows producing 450kg MS/cow. As LUDF has produced 475 kgMS from 630 cows in the 2011/12 and 2012/13 seasons it is realistic to believe the farm can produce sufficient feed for 560 cows producing 500kgMS/cow, even with less Nitrogen fertiliser and imported feed. Milk production this year has indicated the farm had insufficient feed for the stocking rate and production desired – hence the use of imported feed through the spring and summer periods.



Accounting for LUDF across the Whole Farm System (the Catchment Effect)

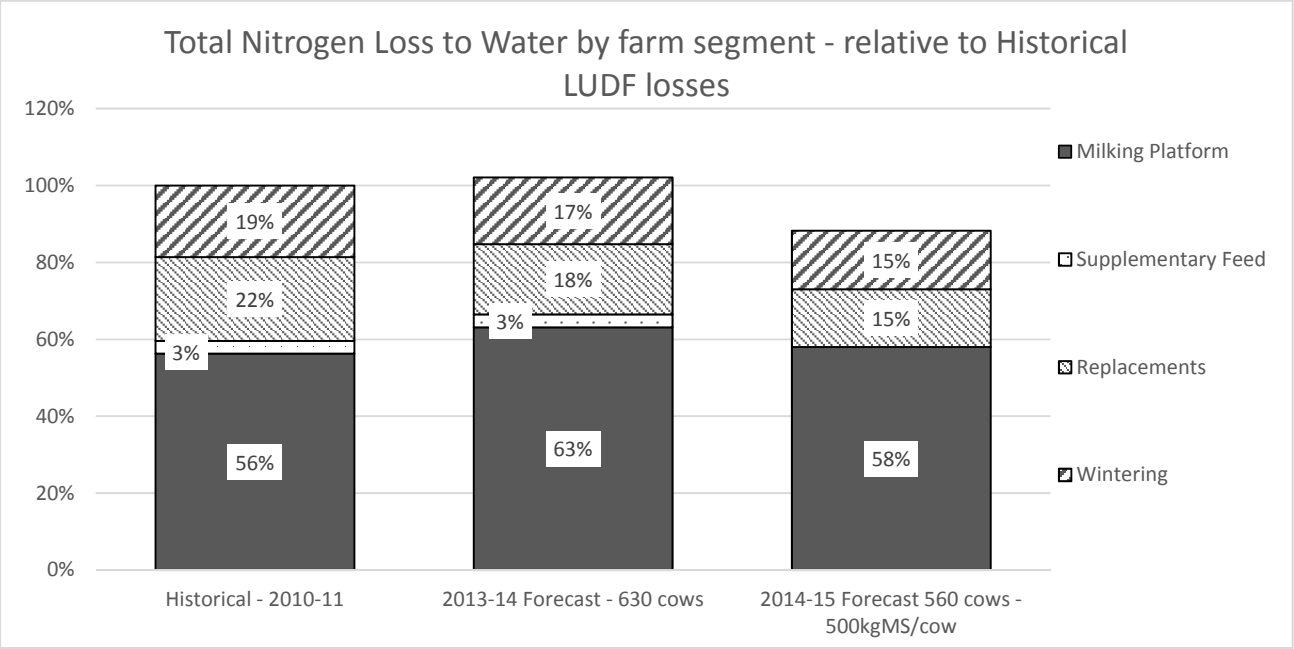


As can be seen above, LUDF's requirement for additional land is reduced as the demand for land for wintering and replacements goes down with fewer animals farmed. Assuming no supplement is required for 2014/15 further decreases the total land required.

Total nitrogen loss to water within the catchment is influenced by the rate of N-loss per hectare and the amount of land required. The graph below suggests a small increase in N-loss at the catchment level has occurred this year (relative to historical losses) whereas the combined effect of lower losses on the milking platform and fewer animals predicts total catchment losses could be approximately 15% lower with the nil-infrastructure, low input system.

Caveat:

It is important to note the Nitrogen losses to water for the 2014-15 season will be entirely dependent on the actual feasibility of the system. The losses portrayed below are based on LUDF using 150 kgN/ha, 300kg supplement/cow, a stocking rate of 3.5 cows/ha and production of 500kgMS/cow. If the system cannot be effectively operated at this level, N-loss may be substantially different – on both the milking platform and at the catchment level – and profitability may be severely constrained.


Total Nitrogen Loss to Water by farm segment - relative to Historical LUDF losses
120%
100%
80%
60%
40%
20%
0%
19%
22%
3%
56%
17%
18%
3%
63%
15%
15%
58%
Historical - 2010-11
2013-14 Forecast - 630 cows
2014-15 Forecast 560 cows - 500kgMS/cow
Milking Platform
Supplementary Feed
Replacements
Wintering

5 GOOD REASONS TO GET A 'WOF'

1. Have you upgraded the effluent system yourself? Then you might want reassurance that your system is fit for purpose.
2. Have you budgeted for an upgrade to the system? An independent person who assesses the current system will help you in your decision making.
3. Are you buying or selling a farm? You need to know if the system is fit for purpose or if you need to factor upgrades into the offer.
4. Are you a sharemilker coming onto a property? Find out how well the effluent system is performing.
5. Corporate Board members and absent owners can be liable if an inadequate effluent infrastructure is installed on a farm. Find out what the risk is for your farm.

DAIRY EFFLUENT 'WOF' WARRANT OF FITNESS

GET YOUR 'WOF' NOW.

For more info on the service, questions & answers and a list of Certified 'WOF' assessors to choose from, check out **www.effluentwof.co.nz** or call 0800 7266 9683

DWOF 131

qconz new zealand

DOES YOUR EFFLUENT SYSTEM TICK ALL THE BOXES?

Find out with the Dairy Effluent 'Warrant of Fitness'

Dairy Effluent WOF

DAIRY EFFLUENT 'WOF' WARRANT OF FITNESS

EFFLUENTWOF.CO.NZ

WHAT IS THE DAIRY EFFLUENT 'WOF'?

The Dairy Effluent 'Warrant of Fitness' (WOF) is a voluntary programme assessing your effluent system. It helps you understand all the requirements to make sure your system is fit for purpose and capable of being compliant 365 days a year. You will receive a brief report with practical actions you can take.

The assessment is carried out by a trained and certified independent professional and takes three to four hours. The certified assessor:

- looks at your farm's effluent consent or permitted rules: are all requirements being met?
- views the nutrient budget and checks nitrogen loadings
- runs the dairy effluent storage calculator to estimate if there is enough storage for the farm effluent system
- checks over the storage facility for signs of possible risk areas
- looks at all catchment areas, particularly stand-offs, feedpads and underpasses
- tests the application depth and rate of the irrigation system
- identifies the hazards and notes general health and safety requirements.

WHAT DOES AN EXAMPLE REPORT LOOK LIKE?

Areas of risk	Why of concern	Suggested action
High application depth	Average depth applied greater than allowed in WRC rules	Repair and maintain irrigator
Siphoning and ponding at first irrigator	Ponding can occur breaching WRC rules	Ensure irrigator is moving after pump turned on. Repair.
Sludge piles on unsealed surface	Leakage from the pile appeared to be going to drain, breaching WRC rules	Place stone trap cleanings on a sealed surface that drains to the effluent system
Pump quite noisy	If it is not working well, irrigator performance may decrease. Risk of catastrophic failure & damage to pump and motor	Have pump serviced or checked out
Camlocks fitted to drag hose in incorrect direction	The camlock legs get damaged when line is moved, also they could catch and uncouple the hose while irrigating	Re-fit the correct way so that the "legs" are not being pulled

HOW MUCH DOES THIS SERVICE COST ME?

This depends on the size of your farm. It will probably be in the range of $500 to $1000. The certified 'WOF' assessor will give you an estimate before coming to your farm.

WHY SHOULD I CHOOSE A CERTIFIED ASSESSOR?

A certified assessor is an independent, experienced industry professional. To become certified, the assessor has completed a three-day training course and passed a competency assessment process. The assessor is committed to observing a Code of Conduct to guarantee professional behaviour and independent advice.

DO COUNCILS RECOGNISE THE 'WOF'?

At this stage the 'WOF' is a voluntary programme that helps you identify and address risks.

LUDF Farm
P O box 94
Lincoln University

Dear Peter and Ron

Thank you for having us on your property to undertake a Dairy Effluent Warrant of Fitness full assessment of your dairy farm effluent infrastructure.

There were a number of examples of good effluent infrastructure identified on your property:

- The current system is well managed
- Average application depth of effluent alone is very good

Acknowledging that your objective is to operate at a high level of good effluent management practice, there were also some areas identified on your property which we feel you may need to address.

Areas of risk	**Why of concern**	**Suggested action**
Storage volume	Your resource consent has not got a storage requirement component. According to the calculator if you irrigate at every opportunity at the current application depth for 5 hours per day there is only a 50.2% chance that your current saucer will be adequate for any one year. In line with industry practice (3 days storage) there is a 20.9% chance that your saucer will be adequate for any one year with the same application conditions	Increase storage capabilities Decrease capture area Divert yard Divert shed roof
Record keeping of effluent application	Records are kept in the diary at the shed but only show paddock number or saucer No record of time irrigated, amount irrigated or which droppers were utilised	More detailed records. GPS tracking along with a flow meter reading and an off time.
Sump	All effluent contained but not alarmed	Install an alarm at the sump
Sump and Solids/Stone trap	Overflow on the day onto a sealed and contained area but the safety fencing was incomplete. H&S risk of falling into sumps	Repair fencing around solid/stone trap
Entry to yard	The entrance off the races to the shed yard has a prominent hump in it and the flow of effluent has the capacity to enter the paddocks and the yard	Consider sealing and nibbing that area so the effluent flows into the yard to be captured.

Concrete at yard entry and exit by start of ramp to underpass	Cracking and gaps in concrete in these areas. New concrete added to old concrete and not sealed.	Consider patching the areas
Saucer	No means of escape from the saucer. No safety signs	Install safety signs and a means of escape
Pipes and fittings	Ball valve at sump looks like it needs attention.	Check valve. Ensure Management plans includes regular maintenance an or inspections on all aspects of the system
Effluent application	Ponding of effluent occurred on the day. Condition 7 of your resource consent was not adhered to.	Staff training. Ensure Management Plan covers the assessment of ground conditions, paddock selection and dropper selection for effluent irrigation.
Nutrient Budget	The Nutrient Budget is formulated for an effluent area of 32 ha. The actual area quoted is 28 ha	This area is still sufficient for the loading requirements of your consent to stay below the 200kg Nitrogen/ha using standard Nitrogen content 668kg /100 cows. Would recommend correcting nutrient budget to correct land availability

However, continuing good management of your system is crucial to avoid any future issues.

We recommend that you get your system reassessed in 3 years' time.

Thank you for taking the time to host us on your property, please do not hesitate to contact us if you have any questions

Best regards

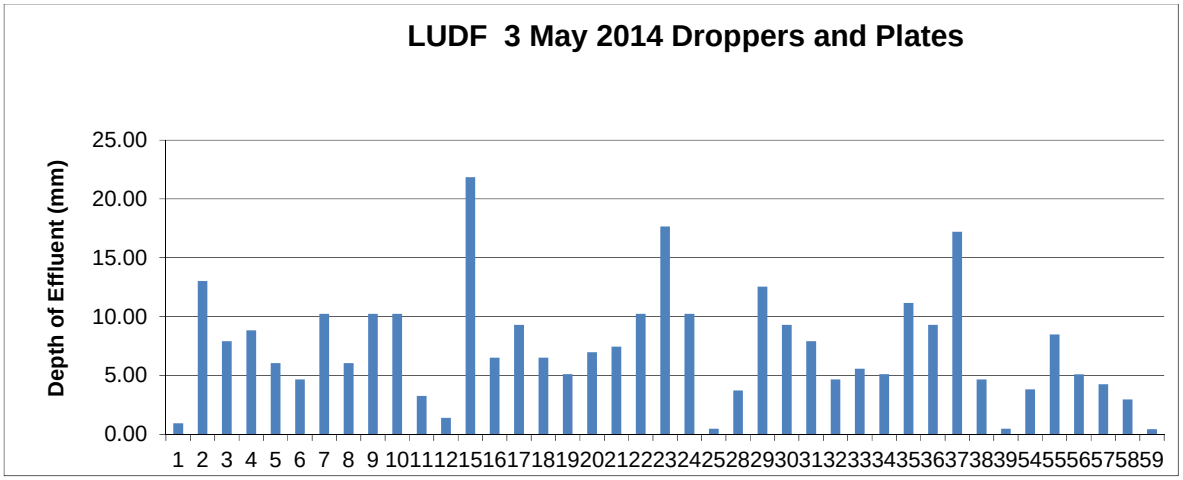
Barbara Perkinson
Environmental and Civil Solutions Ltd
Ph 0211262910
111 Winslow Willowby Road
R D 5
Ashburton

LUDF comments in relation to the above factors:

Saucer: The saucer has permanent steps into the base of the saucer, therefore the comment is unclear

Ponding: The degree of ponding is not stated, the assessment was conducted at the end of a week of wet weather following 2 months of above average rainfall and saturated soils. LUDF accept the report as written but note it is LUDF's perception that ponding was not occurring.

Application depth test showing distribution of the applicator on the day and maximum and average depths applied in the test;
Application test completed on the second set of 7 droppers and plates on spans 5 (6) and 6 (1) In paddock N-7



Max depth(mm):	**21.85**
Average depth (mm):	**7.36**

DISCLAIMER

This Report represents our assessment of whether the effluent system on your farm meets the best industry practice as identified by the Dairy Effluent Warrant of Fitness (DE'WoF') Certification Advisory group as at the date of the assessor's inspection. The issue of the DE'WoF' Report (Report) is not a warranty or confirmation that the effluent system fully complies with any requirements of any relevant authority either as at the date of the issue of the Report or in the future. To the maximum extent permitted by law, any condition or warranty that would otherwise be implied into these terms and conditions is hereby excluded.

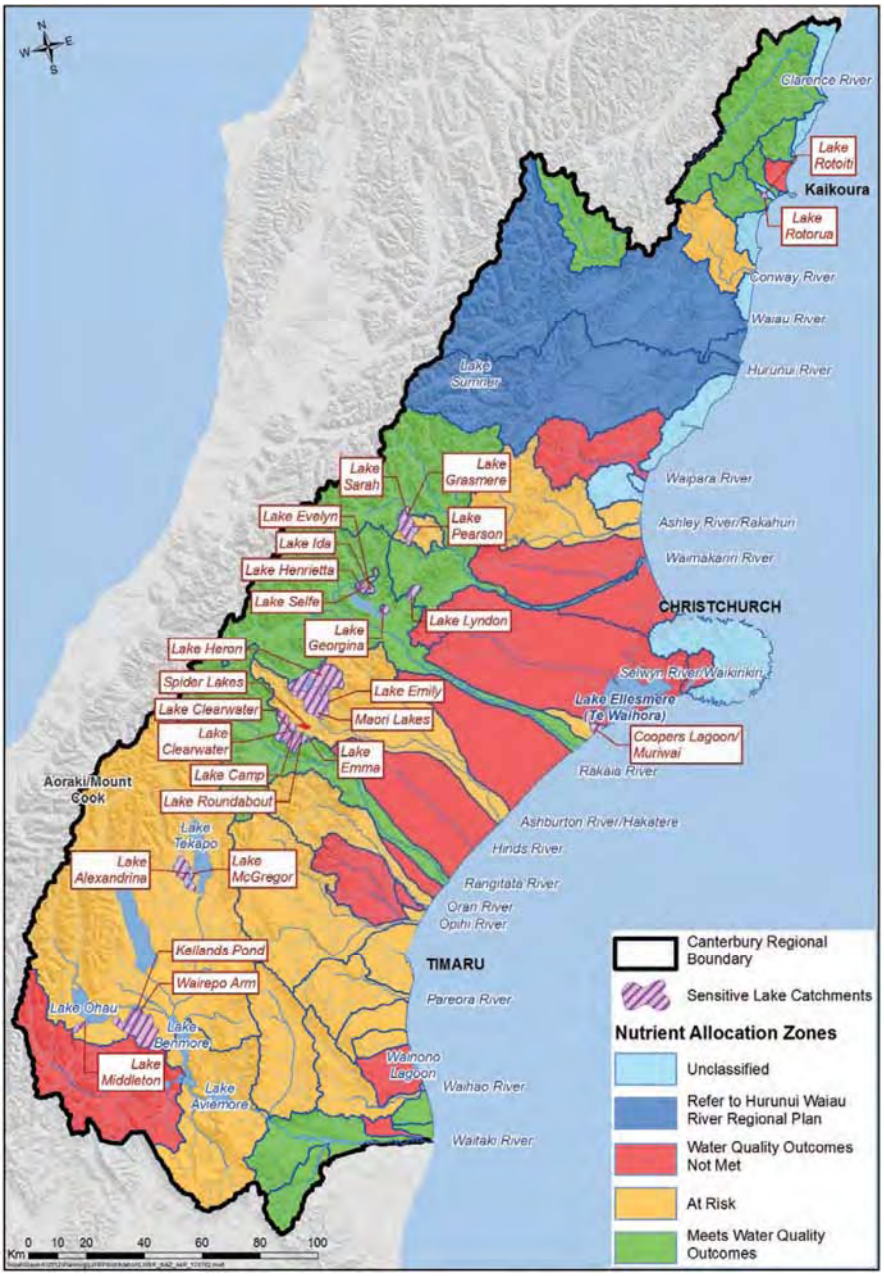
While all reasonable endeavors have been made to ensure the accuracy of the information contained in this Report, DairyNZ Limited, the administrators and assessors of the DE'WoF' programme do not accept responsibility for any loss or damage (whether direct, indirect, consequential or other), however caused (including through negligence), which you may directly or indirectly suffer in connection with your use of this Report, and expressly disclaims any and all liabilities contingent or otherwise that may arise from any such loss arising out of your use of or reliance on information contained on or accessed through this Report. You agree that the above exclusion of liability confer a benefit on the entities or persons listed above and are enforceable by each of them in accordance with the contracts (Privity) Act 1982.

Farm Environment Plans

Information prepared by Tony Fransen, DairyNZ - Catchment Engagement Leader
For queries or specific information, email tony.fransen@dairynz.co.nz or phone 021 703 044

As a result of the Environment Canterbury Land and Water Regional Plan a 'Farm Environment Plan' will be required on every Canterbury dairy farm (the date it is required may vary). Many farms from other sectors will also need a Farm Environment Plan depending on their size, nutrient allocation zone, and nutrient loss values.

The first step to knowing if or when you need a Farm Environment Plan is to know which Nutrient Allocation Zone you are in by using the map below. (Also available on the ECan website in detail).

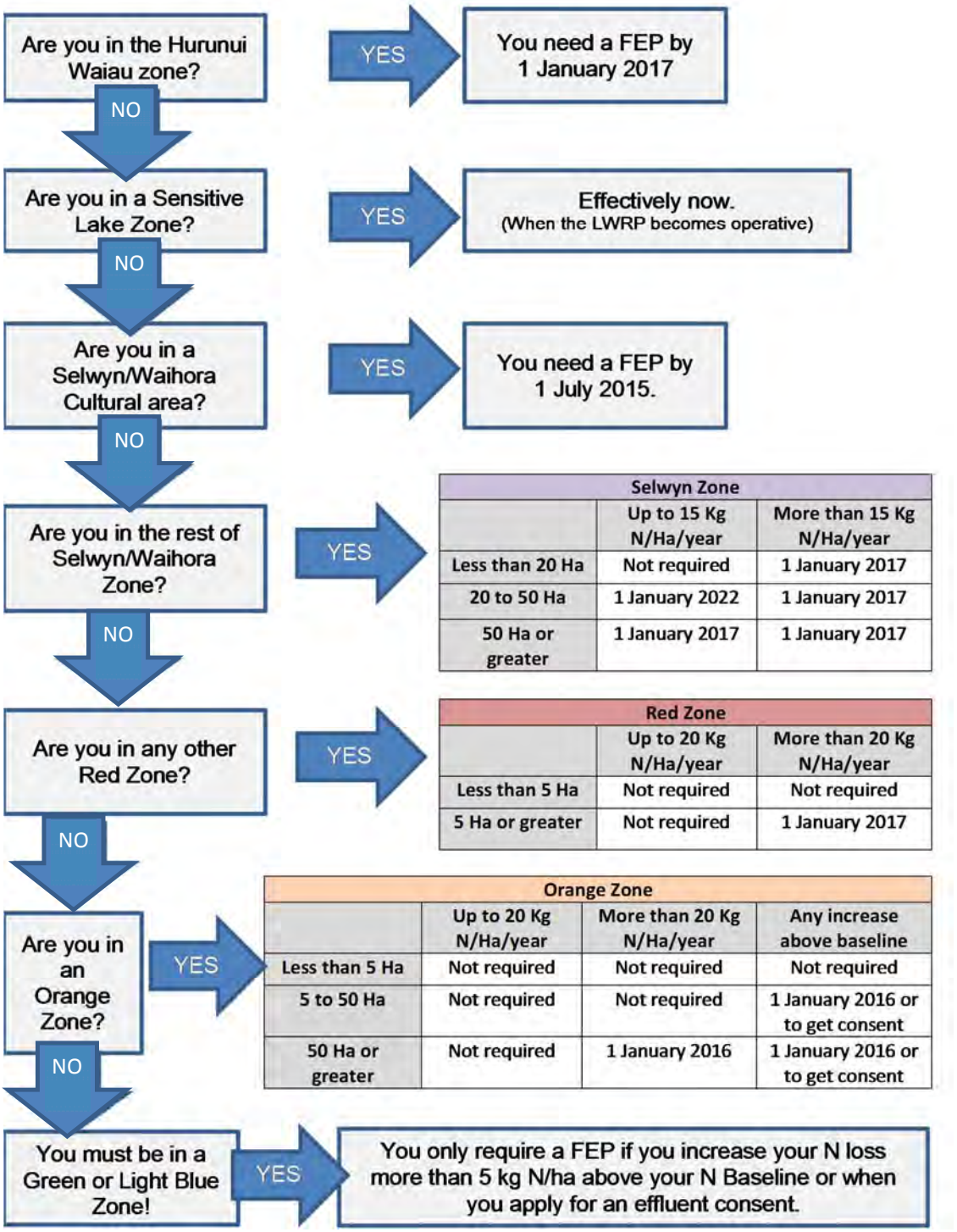


When do I as a Dairy Farmer need a Farm Environment Plan (FEP)?

If you are part of an **irrigation scheme** which is granted a resource consent with nutrient loss conditions the resource consent will specify a particular date which takes precedence over this table.

OR

If you are applying for **effluent consent** or consent renewal the consent will have a condition requiring a FEP either at application or within xx days of the consent being granted (regardless of your nutrient loss number)



Selwyn Zone		
	Up to 15 Kg N/Ha/year	More than 15 Kg N/Ha/year
Less than 20 Ha	Not required	1 January 2017
20 to 50 Ha	1 January 2022	1 January 2017
50 Ha or greater	1 January 2017	1 January 2017

Red Zone		
	Up to 20 Kg N/Ha/year	More than 20 Kg N/Ha/year
Less than 5 Ha	Not required	Not required
5 Ha or greater	Not required	1 January 2017

Orange Zone			
	Up to 20 Kg N/Ha/year	More than 20 Kg N/Ha/year	Any increase above baseline
Less than 5 Ha	Not required	Not required	Not required
5 to 50 Ha	Not required	Not required	1 January 2016 or to get consent
50 Ha or greater	Not required	1 January 2016	1 January 2016 or to get consent

ECan LWRP: Schedule 7 - Part B – Farm Environment Plan Content

The plan requirements will apply to:

1) a plan prepared for an individual property or farm enterprise; or
2) a plan prepared for an individual property which is part of a collective of properties, including an irrigation scheme, principal water supplier, or an Industry Certification Scheme.

The plan shall contain as a minimum:

1. Property or farm enterprise details
   a. Physical address
   b. Description of the ownership and name of a contact person
   c. Legal description of the land and farm identifier
2. A map(s) or aerial photograph at a scale that clearly shows:
   a. The boundaries of the property or land areas comprising the farm enterprise.
   b. The boundaries of the main land management units on the property or within the farm enterprise.
   c. The location of permanent or intermittent rivers, streams, lakes, drains, ponds or wetlands.
   d. The location of riparian vegetation and fences adjacent to water bodies.
   e. The location on all waterways where stock access or crossing occurs.
   f. The location of any areas within or adjoining the property that are identified in a District Plan as "significant indigenous biodiversity".
3. A list of all Canterbury Regional Council resource consents held for the property or farm enterprise.
4. An assessment of the adverse environmental effects and risks associated with the farming activities and how the identified effects and risks will be managed, including irrigation, application of nutrients, effluent application, stock exclusion from waterways, offal pits and farm rubbish pits.
5. A description of how each of the following objectives will, where relevant, be met.
   a) **Nutrient management:** To maximise nutrient use efficiency while minimising nutrient losses to water.
   b) **Irrigation management:** To operate irrigation systems efficiently and ensuring that the actual use of water is monitored and is efficient.
   c) **Soils management:** To maintain or improve the physical and biological condition of soils in order to minimise the movement of sediment, phosphorus and other contaminants to waterways.
   d) **Collected animal effluent management:** To manage the risks associated with the operation of effluent systems to ensure effluent systems are compliant 365 days of the year.
   e) **Livestock management:** To manage wetlands and water bodies so that stock are excluded as far as practicable from water, to avoid damage to the bed and margins of a water body, and to avoid the direct input of nutrients, sediment, and microbial pathogens.
   f) **Offal pits:** to manage the number and locations of pits to minimise risks to health and water quality

   The plan shall include for each objective in 5 above
   a. detail commensurate with the scale of the environmental effects and risks;
   b. defined measurable targets that clearly set a pathway and timeframe for achievement and set out defined and auditable "pass/fail" criteria;
   c. a description of the good management practices together with actions required;
   d. the records required to be kept for measuring performance and achievement of the target.
6. Nutrient budgets, prepared by a suitably qualified person, using the OVERSEER™ nutrient budget model, or equivalent model approved by the Chief Executive of Environment Canterbury, for each of the identified land management units and the overall farm or farm enterprise.

What is the industry doing to help dairy farmers meet this regulation?

DairyNZ is working to get the DairyNZ Sustainable Milk Plan approved by Environment Canterbury as an industry approved Farm Environment Plan template. DairyNZ is working with the milk companies through this process and working to align as best as possible with the existing and new initiatives of each individual company. To link with Supply Fonterra's environment programme, work with Westland Milk Products and align with their supplier code of practice, and complement Synlait Milk's Lead with Pride programme (which is also working to become approved by ECan).

The dairy & irrigation industries are also trying to align systems where possible, particularly with irrigation schemes to avoid duplication. Irrigation schemes which gain resource consent for land use with a nutrient discharge allowance for the whole scheme will be required to set up an Audited Self-Management (ASM) environment programme that includes individual Farm Environment Plans for its shareholders to demonstrate compliance with the resource consent.

There are many other organisations with various templates being created. I would recommend farmers to ask either their irrigation scheme or milk company for clarification on which templates align with their compliance requirements.
There is currently, and will be a lot more development occurring in this space over the next few months. I recommend not rushing into creating a FEP for your farm just yet however I strongly recommend you prepare as much information about your farm as you can so you are ready for when you do need to do your FEP.

What should you do now to start preparing?

RECORD:
Gather this information for each property:

- All resource consents (i.e. water takes, irrigation, effluent, septic tanks)
- Nutrient budget, & nutrient management plan
- Farm map including: boundaries, main roads, irrigation areas, effluent areas, hill vs flat areas, soil types, waterways, wetlands, cropping areas, effluent ponds, offal pits, bores
- Effluent management plan
- Any other effluent, irrigation, or farm operating procedures
- Any record keeping systems for fertiliser, supplements, effluent, irrigation systems that may show quantity, proof of placement, management, staff training, maintenance

MEASURE:
Do some simple testing of equipment to ensure it is preforming:

- Bucket test effluent systems to measure application depth and rate
- Bucket test irrigation systems for application depth and rate (maybe a chance now to identify issues and fix any major problems before the start of the next irrigation season)
- Tray testing farm fertiliser spreaders or muck spreaders to determine calibration and spread width

TRAINING:
Ensure the right people on your team have the right skills to carry out good practice:

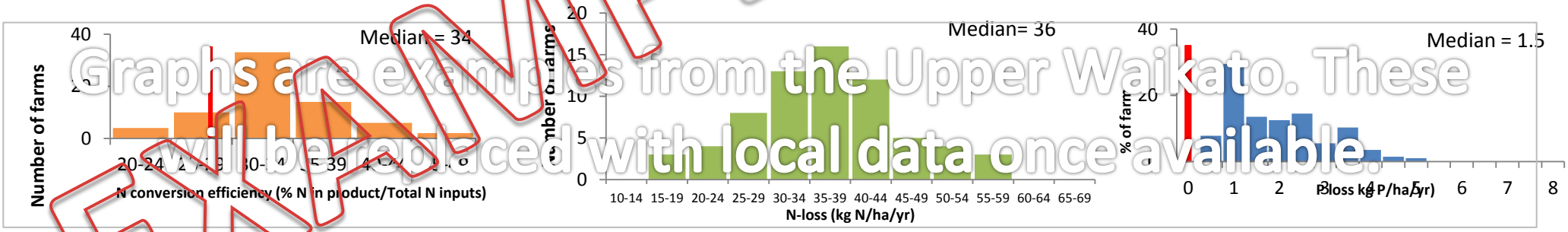
- Explore opportunities to up-skill existing (and train new) staff on good environmental practices and correct management of systems i.e. effluent, lane management, risk areas
- Explore off farm training options for managers and staff. Including PrimaryITO Effluent courses, IrrigationNZ Manager training, Ag Services Ltd Nutrient Management training.

DairyNZ Sustainable Milk Plan

Contact Person(s):	John & Mary Farmer		***Farm Name:***	Farmers Farm	***Plan Writer:***	Tony Fransen	
Physical Address:	1 Farm Road, R.D.1, Lincoln		***Ownership type:***	Owner Operator	***Date:***	01-May-14	
Email Address:	john_mary@farmside.co.nz		***Supply Number:***	XXXX	***Region:***	Canterbury	
Title Legal Description:	XXXX				**Total Farm Area (ha):**	200	**Effective (ha):** 190
Resource Consents Held:	CRC XXXX				**Farm contour (% flat/rolling/steep):**	100% Flat	
District/Zone:	Selwyn Te Waihora				**Number of Support blocks:**	150ha Hororata	
Catchment:	L II Stream	**Climate Site:**	Lincoln		**Crop types and area (ha):**	60ha Kale; 85ha Pasture; 35ha Silage	
Soil Types Present (ha):	Templeton (120ha); Temuka (80ha)				**Peak Herd Size:**	700	**Stock Rate:** 3.5
Irrigation Scheme:	None - Independent Irrigator				**Effluent Application area (ha):**	120	**Consented:** 200
Annual Volume (m³):	12,000,000	**Irrigation Flow (L/sec):**		60	**Kg effluent-N/ha/yr applied**	115	**Consented:** 200
Irrigation Type:	Centre Pivot	**Number:** 2	**Ha:**	135	**Effluent storage volume (m³):**	1,200	**Consented:** 1,200
Irrigation Type:	Sprinkler	**Number:** 45	**Ha:**	55	**Number of water takes:**	2 (2)	**Metered:** 2
Irrigation Type:		**Number:**	**Ha:**		**Irrigation Water use efficiency:**	75%	**Target:** 80%

Nutrient management indicators:

Date of nutrient budget:	01/01/2014	**Overseer Version:**	6.1.2



	Actual	Target		Actual	Target		Actual	Target
N Conversion efficiency (2013/14) (%):	28		**N Leached (13/14) (kg N/ha/yr):**	38		**P loss (13/14) (kg P/ha/yr):**	1.3	
N Conversion efficiency (2014/15) (%):	29		**N Leached (14/15) (kg N/ha/yr):**	35		**P loss (14/15) (kg P/ha/yr):**	1.2	

Major environmental risks identified for this farm:	Low infiltration rate, pugging, and potential for sediment and phosphorous loss through runoff of Temuka soils. Risk of surface water flows during heavy rain events.
	Management of the effluent system during wet periods (especially spring).
	Tributary stream and adjoining wetland areas inhabited with native fish and vegetation which need to be protected.

	Level	Good farm environmental management practices currently carried out:	Evidence Required:	Note
Irrigation & Water Management	Compliance	Irrigation events are recorded using a soil water balance to ensure just in time irrigation management.	Moisture monitoring graphs and irrigation records	
	Voluntary	Aquaflex soil moisture monitoring installed and used for irrigation management.	Moisture monitoring graphs	
	Compliance	Water meter installed on irrigation water takes, reported to computer system.	Water monitoring report	
	Voluntary	Weekly sprinkler inspections across both pivots for blocked nozzles, leaks, dropper hoses across pivot frames, or any visible concerns with the pivot irrigators. Record date and issues addressed or identified in irrigation diary.	Farm irrigation diary	
Nutrient Management	Compliance	Nutrient budgets are used annually with the fertiliser consultant.	Nutrient Budget	
	Voluntary	Soil testing is carried out annually to inform fertiliser requirements and trends (with individual paddock testing occurring every 5 years).	Soil Test Report	
	Voluntary	No nitrogen fertiliser is applied in May through to July.	Fertiliser Accounts	
Effluent Management	Compliance	Effluent storage facility lined with a synthetic liner.	Site inspection	
	Compliance	Effluent spreading and irrigator runs are recorded on run sheet on the dairy shed wall.	Irrigator run sheet	
	Compliance	The effluent management plan visible on dairy wall.	Site visit	
	Voluntary	A PTO pump is on farm for an emergency pump breakdown.	Sight pump	

	Level	Good farm environmental management practices currently carried out:	Evidence Required:	Note
Waterway & Biodiversity Management	Compliance	Fenced off of all waterway access, especially the long boundary with the Tributary Stream edge. Full stock exclusion.	Site visit	
	SDWA	Riparian planting being phased in each year along this fenced off area.	Site visit	
	Voluntary	Identified wet spot in South-eastern paddock fenced off to avoid livestock entry and damage.	Site visit	
Land & Soil Management	Voluntary	Minimising soil pugging during wet periods with a managed grazing based on soil type.	Farm inspection/ questioning	
	Voluntary	Minimum cultivation used on property, all regrassing is spray and direct drill.	Site visit if possible/ questioning	
	Voluntary	If cultivation is required in paddocks adjoining Tributary stream, a minimum grass buffer strip of 5 m is left uncultivated to minimise soil loss to the waterway.	Site visit if possible/ questioning	
Environmental Hotspot Management	Voluntary	Plastic bale wrap is removed from the farm using AgRecovery.	AgRecovery documents	
	Voluntary	Slink calves are collected from the farm for disposal.	Questioning	

	Level	Agreed actions for improvement:	Demonstrated by:	Who?	By When?	Complete?	Cost?
Irrigation & Water Management:	Voluntary	Test both the centre pivots performance. Application depth and rate testing, and flow rates (bucket test).	Test results	Consultant	01/04/2015		
	Voluntary	Carry out a depth test (bucket test) and flow rates on areas where sprinklers are used.	Test results	Farmer	01/04/2015		
	Voluntary	Investigate the options for staff training in Irrigation Management.	Questioning methodology, discuss follow-up actions.	Farmer	01/06/2015		
	SDWA	Monitor actual dairy shed water use, identify any areas for water use efficiency within the dairy shed.	Questioning methodology, discuss follow-up actions.	Farmer	01/06/2015		
Nutrient Management:	Voluntary	Investigate the options for soil mapping the farm to enable more accurate fertiliser and irrigation placement.	Questioning methodology, discuss follow-up actions.	Farmer	01/06/2015		
	Voluntary	Request GPS proof of placement data from Fertiliser spreading contractor for all fertiliser applications.	Spreading maps	Farmer	01/06/2015		
	Voluntary	Discuss alternative fertiliser requirements on the effluent block with fertiliser representative.	Questioning methodology, discuss follow-up actions or changes.	Farmer	01/06/2015		
Effluent Management:	Voluntary	Test the nutrient values of the effluent from the storage pond.	Test results	Farmer	01/04/2015		
	Voluntary	Provide external training for junior farm staff around effluent management. PrimaryITO Dealing with effluent course.	Completion Certificate	Farmer	01/06/2015		
	Voluntary	Carry out an application depth test (Bucket test) on the effluent irrigator to inform effluent spreading decisions and maintenance.	Test results	Farmer	01/04/2015		

	Level	Agreed actions for improvement:	Demonstrated by:	Who?	By When?	Complete?	Cost?
Waterway & Biodiversity Management:	Voluntary	Continued riparian planting as part of planting programme 200 Native plants along SE boundary.	Site visit	Farmer	01/06/2015		
	Compliance	Fence off and plant overflow drain that runs across the corner of paddock 25.	Site visit	Farmer	01/06/2015		
	Voluntary	Plant appropriate wetland plants around fenced off wet area in paddock 17.	Site visit	Farmer	01/06/2015		
Land & Soil Management:	Voluntary	Laneway edges to be re-cambered and maintained to allow race runoff to flow into grassy paddocks and minimise any direct runoff waterways.	Site visit	Farmer	01/06/2015		
Environmental Hotspot Management:	Voluntary	Identify options for capturing silage leachate from the silage bunkers.	Questioning methodology, discuss follow-up actions or changes.	Farmer	01/06/2015		
	Voluntary	Identify options for reducing farm waste required to be disposed of on farm.	Questioning methodology, discuss follow-up actions or changes.	Farmer	01/06/2015		
	Voluntary	Close off and pack soil over old farm dump in the corner of paddock 12 and locate a smaller pit in paddock 7 in the area above the water table.	Site visit, old and new sites	Farmer	01/06/2015		

NUTRIENT MANAGEMENT for Farmers

Manage the nutrient inputs and outputs on your property more effectively from participating on this two day workshop.

Workshop Objectives

- Understand how nutrients move in soils, particularly Nitrogen and Phosphate
- Nutrient budgeting to quantify and track nutrient sources and outputs
- Potential environmental impacts of nutrient use
- Understand the benefits of Overseer® its limits and assumptions
- Understand the drivers behind Overseer® and how they impact on Nitrogen leaching and Phosphate runoff and the implications for your farm's performance.
- Manage the factors that limit Nitrogen leaching and Phosphate runoff

The workshops are held over two days, two weeks apart.

Stage 1 workshop:Wednesday 21 May 10.00am – 2.30pm

Stage 2 workshop:Wednesday 4 June 9.30am – 3.00pm

Venue: Ashburton, location confirmed on registration.

For further information and registration please phone or email Susan Turu on 06 3503947 or susan.turu@agservices.co.nz

Workshop investment: $450 GST exclusive (covers both workshops)

Lunch included

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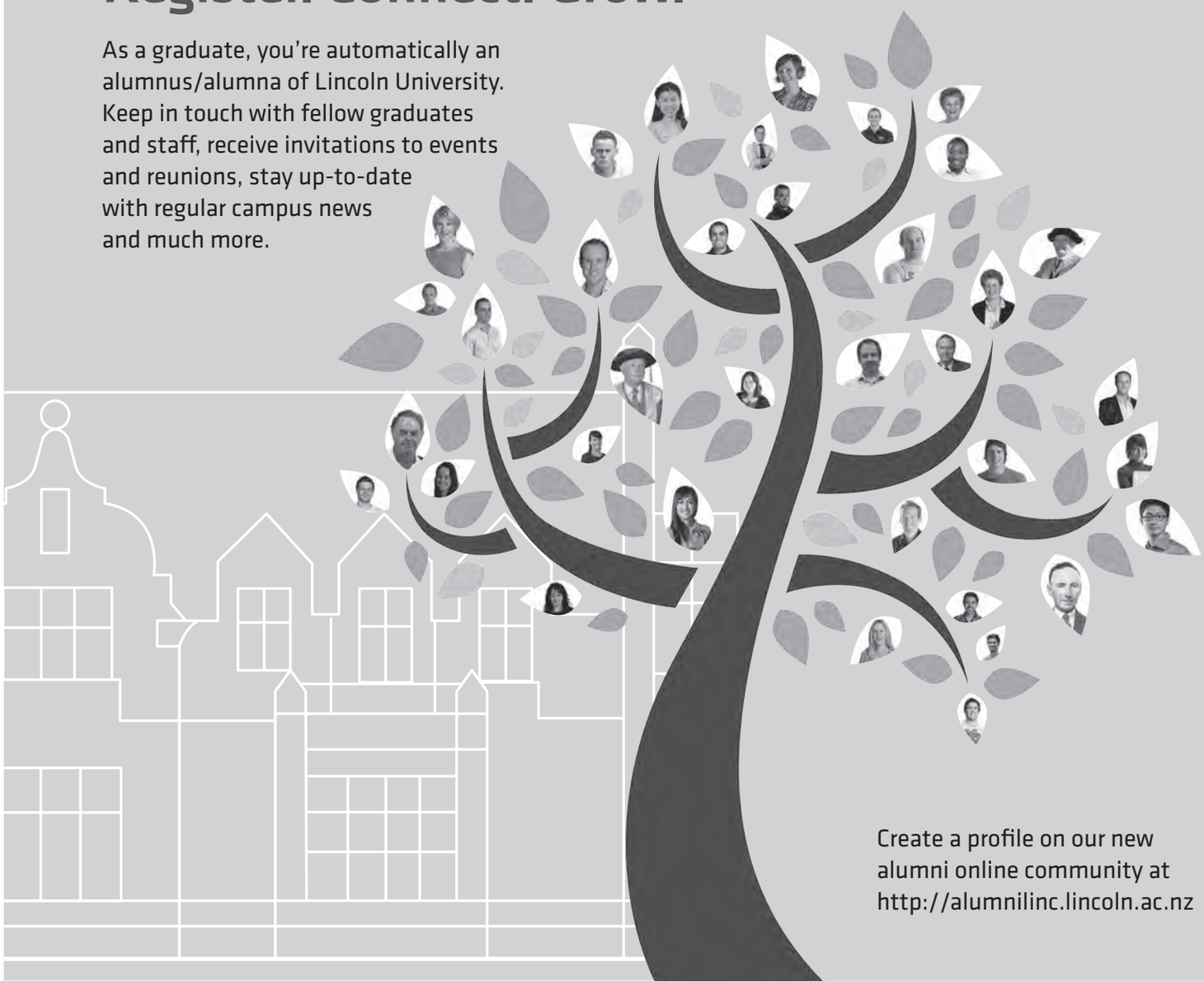

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