SIDDC
South Island Dairying Development Centre

LINCOLN UNIVERSITY DAIRY FARM

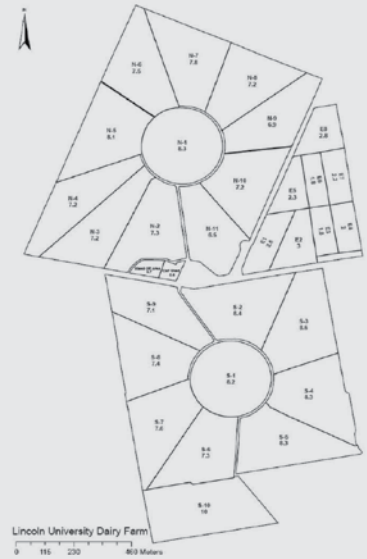
FOCUS DAY
MAY 2018

STAFF

Peter Hancox	– Farm Manager
Sean Collins	– 2IC
Erica Taylor	– Dairy Assistant
Charlotte Munnik	– Dairy 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



Partners Networking To Advance South Island Dairying

Lincoln University
New Zealand's specialist land-based university
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Plant & Food RESEARCH
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SIDE

INTRODUCTION

The LUDF is a progressive farming development facility that is committed to advancing dairy farming practice across the South Island, with particular consideration to productivity and environmental sustainability. Formerly the University sheep farm, the converted 186 hectare Dairy Farm is an excellent cross section of the various soil types evident across the Canterbury Plains. The property, of which 160 hectares is the milking platform, is irrigated using a spray system that includes two centre pivots, small portable lateral sprinklers and k-lines.

STAGE 1: 2001/2 AND 2002/3

The farm initially wintered approximately 630 cows, peak milking just over 600 and producing about 1400kgMS/ha from 200kgN/ha and up to 550kg DM/cow of imported feed. The milk payout (income) in 2002/3 was $4.10/kgMS.

STAGE 2: 2003/4 THROUGH TO 2010/11

During this period the primary development was the increase of the stocking rate to between 4 and 4.3 cows per ha. 654-683 cows peak milked and as a result production averaged 1700kgMS/ha and 411kgMS/cow. LUDF ran a single herd during stage two, to allow us to focus primarily on simple systems, and low and consistent grazing residuals.

STAGE 3: 2011/12 TO 2013/14

The further development of LUDF during stage 3 was a move into 'Precision Dairying', resulting from the implementation of the strategic objective (below). This stage focused on minimum standards, two herds were run to increase productivity and profitiability, from a similar environmental impact. Production lifted to 1878kgMS/ha or 477kgMS/cow (630 cows). A change in farm practice was initiated in 2013/14, with the temporary suspension of Eco-n (DCD), in an attempt to hold nitrogen losses without the mitigation effect of Eco-n.

STAGE 4: CURRENT

LUDF is adopting a 'Nil-Infrastructure, low input' farm system emerging from the P21 (Pastoral 21) research programme, in partial response to the tightening environmental requirements of some catchments across NZ. Targeted milk production is 1750kgMS/ha or 500kgMS/cow from 3.5 cows/ha with up to 150kgN/ha and 300kgDM/cow imported supplement.

LUDF STRATEGIC OBJECTIVE:

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

1. To develop and demonstrate world-best practice pasture based dairy farming systems and to transfer them to dairy farms throughout the South Island.

2. 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.

3. To manage pastures and grazing so per hectare energy production is optimised and milkers consume as much metabolisable energy [ME] as practicable (within the constraints of the current system and the associated nutrient losses).

4. To optimize the use of the farm automation systems and demonstrate / document improved efficiencies and subsequent effect on the business.

5. To achieve industry targets for mating performance within a 10 week mating period, including a 6 week in-calf rate of 78% and 10 week in calf rate greater than 89% i.e. empty rate of less than 11%.

6. To actively seek labour productivity gains through adoption of technologies and practices that reduce labour requirements or makes the work environment more satisfying.

7. To assist Lincoln University to attract top quality domestic and international students into the New Zealand dairy industry.

ONGOING RESEARCH

- The effect of farm management on groundwater and nutrient losses. (includes 10 groundwater monitoring wells, 60 lysimeters and 6 drainage plots to monitor and manage the effect of fertiliser, grazing, irrigation and effluent inputs over a variety of contrasting soil types.
- Pasture growth rates, pests and weeds monitoring, including a Forage Value Index paddock scale cultivar trial.
- Winter cropping effects on subsequent cow and calf performance.
- Yield mapping of pastures across the season
- Native Plantings – biodiversity effects
- Resource Inventory and Greenhouse Gas Footprint

CLIMATE

Mean 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**

SOIL TYPES

Free-draining shallow stony soils (Eyre soils) **5**
Deep sandy soils (Paparua and Templeton soils) **45**
Imperfectly drained soils (Wakanui soils) **30**
Heavy, poorly-drained soils (Temuka soils) **20**

FARM AREA

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

SOIL TEST RESULTS AND FERTILISER APPLICATIONS

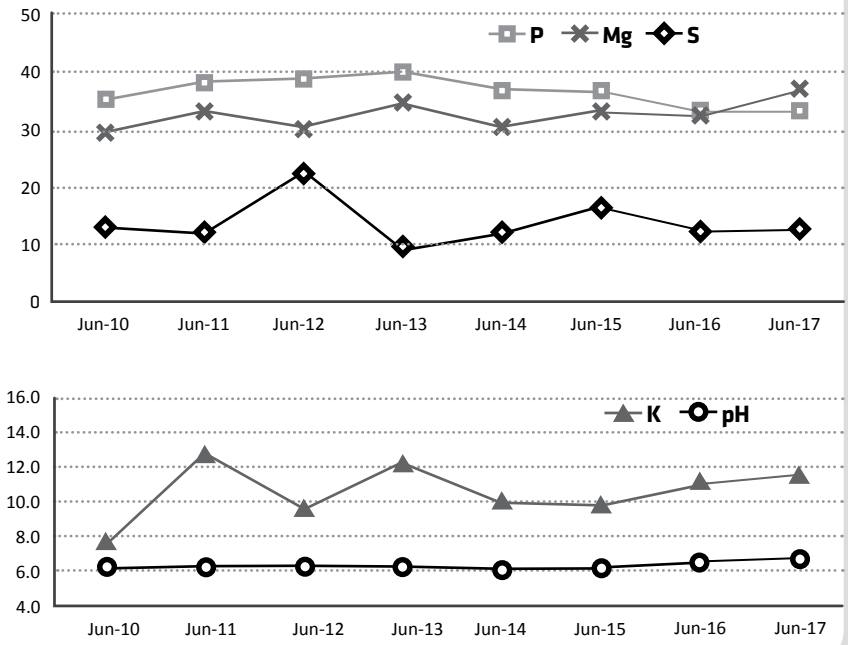
Target Soil Test Ranges:

pH: **5.8 – 6.2** P: **30 – 40** K: **5 – 8**
S: **10 – 12** Mg: **20+**

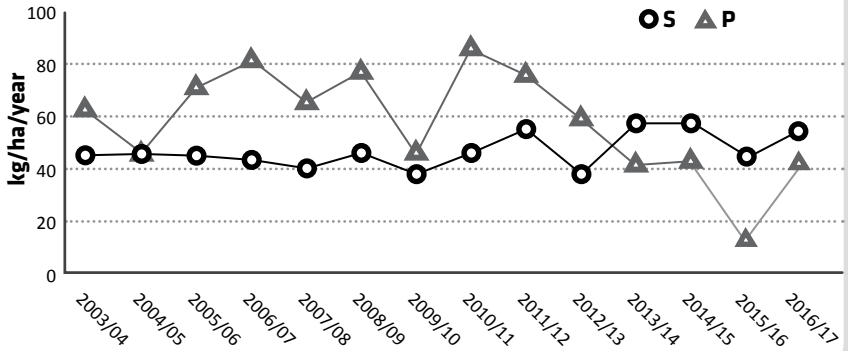
PASTURE

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

WHOLE FARM AVERAGE SOIL TEST RESULTS



WHOLE FARM AVERAGE P AND S APPLICATIONS 2003/04 - 2016/17



Paddock	Period Regrassed	Grass Cultivar
N1	Dec-17	Plantain, Shogun
N2	Feb-11	Trojan
N3	Nov-12/Sept-13	Shogun/Chicory/Plantain/Troj
N4	Feb-15	Base/Troj/Chicory/Plantain
N5	Dec-11/Aug-13	Shogun
N6	Apr-14/Sept-16	Shogun (spray/drill)
N7	Jan-14	Bealey/Troj/Chicory/Plantain
N8	Jan-13	Bealey/Troj/Chicory/Plantain
N9	Oct-13	Bealey/Troj/Chicory/Plantain
N10	Jan-12	Tetraploids (FVI trial)
N11	Nov-07	Bealey

Paddock	Period Regrassed	Grass Cultivar
S1	Dec-05	Bealey
S2	Dec-10	Troj. Bealey
S3	Feb-10	Bealey/Arrow
S4	Dec-13	Bealey/Troj/Chicory/Plantain
S5	Dec-16	Shogan/Bealey
S6	Dec-14	Shogan/Chi/Plant (spray/drill)
S7	Nov-15	Base/Troj/Plantain
S8	Oct-11	Troj. Bealey
S9	Dec-09	Bealey/Arrow
S10	Nov-14	Shogan/Chicory/Plantain
All paddocks also sown with clover		

STAFFING AND MANAGEMENT

Roster System – 8 days on 2 off, 8 days on 3 off
Milking Times – cups on 5.00am / 2.30pm

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 2017

Yearling heifers - AI mated for 10 days, then PG & continue AI. Daughter Proven Kiwi XX. Follow with bulls, total 9 weeks mating.

MA cows – sexed semen for 1 week prior to normal PSM. 3 weeks Forward Pack Premier Sires then Short Gestation Dairy and natural mating weeks 7-9.

Heifers to start calving 2 weeks prior normal start mating.

HERD DETAILS – APRIL 2018

Breeding Worth (rel %) 104 / 47
Production Worth (rel%) 133 / 67
Recorded Ancestry 99%

Average weight / cow
Herd monitored walk over weighing
454 kg [Oct 2017]

Calving start date 2017
Heifers 14 July, Herd 1 August

Est. Median calving date
12 August 2017

Mating start date
25 October 2016 (heifers 15 days earlier)

Empty rate (nil induction policy) after 10 weeks mating - 15% (2016-17 mating). 6 week in-calf rate 63%.

	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Total kg/MS supplied	278,560	261,423	273,605	262,112	297,740	300,484	276,019	278,654	289,906	286,189
Average kg/MS/cow	409	384	415	391	471	477	440	498	522	516
Average kg/MS/ha	1,744	1,634	1,710	1,638	1,861	1,878	1,725	1742	1812	1789
Farm working expenses /kgMS	$3.37	$3.88	$3.38	$3.86	$3.91	$3.84	$4.28	$3.87	$3.47	3.76
Dairy operating profit/ha	$8,284	$2,004	$4,696	$6,721	$4,553	$4,665	$7,578	$1200	$1182	$4728
Payout (excl. levy) $/kg (Milk price + div)	$7.87	$5.25	$6.37	$7.80	$6.30	$6.12	$8.50	$4.60	$4.30	$6.52
Return on assets	14.6%	4.8%	7%	7%	6%	6%	10%	1.6%	1.6%	6.5%
1 July cow numbers	704	704	685	694	665	650	650	580	578	580
Max. cows milked	680	683	660	669	632	630	628	560	555	554
Days in milk	263	254	266	271	272	273	259	263	267	270
Stocking rate cow equiv./ha	4.2	4.3	4.13	4.18	3.95	3.94	3.92	3.5	3.47	3.62
Stocking rate Kg liveweight/ha	2,058	2,107	1,941	1914	1860	1878	1872	1680	1724	1700
Grazing off - Dry Cows (tDM/ha)	546/9	547/7	570/9	652/8.4	650/9.8	650/9.8	650/11.4	580/10.7	3.5	3.2
No. yearlings grazed - On/Off	0/171	0/200	0/160	0/166	0/141	0/138	0/140	0/126	0/126	0/133
No. calves grazed - On/Off	0/200	0/170	0/160	0/194	0/190	0/156	0/150	0/126	0/155	0/150
Past eaten (dairybase) (tDM/ha)	17.9	17.2	16.2	16.9	17.3	16.8	14.9	15.7	16.6	16.0
Purch. Suppl - fed (kgDM/cow)	415	342	259	463	359	434	506.8	300	126	397
Made on dairy/platform (kgDM/cow)	95	64	144	160	154	93	0	40	277	104
Applied N/160 eff. Ha	164	200	185	256	340	351	252	143	179	173

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T: 03 423 0022
E: office@siddc.org.nz
W: www.siddc.org.nz

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LUDF FARM SYSTEM OVERVIEW:

STRATEGIC OBJECTIVE

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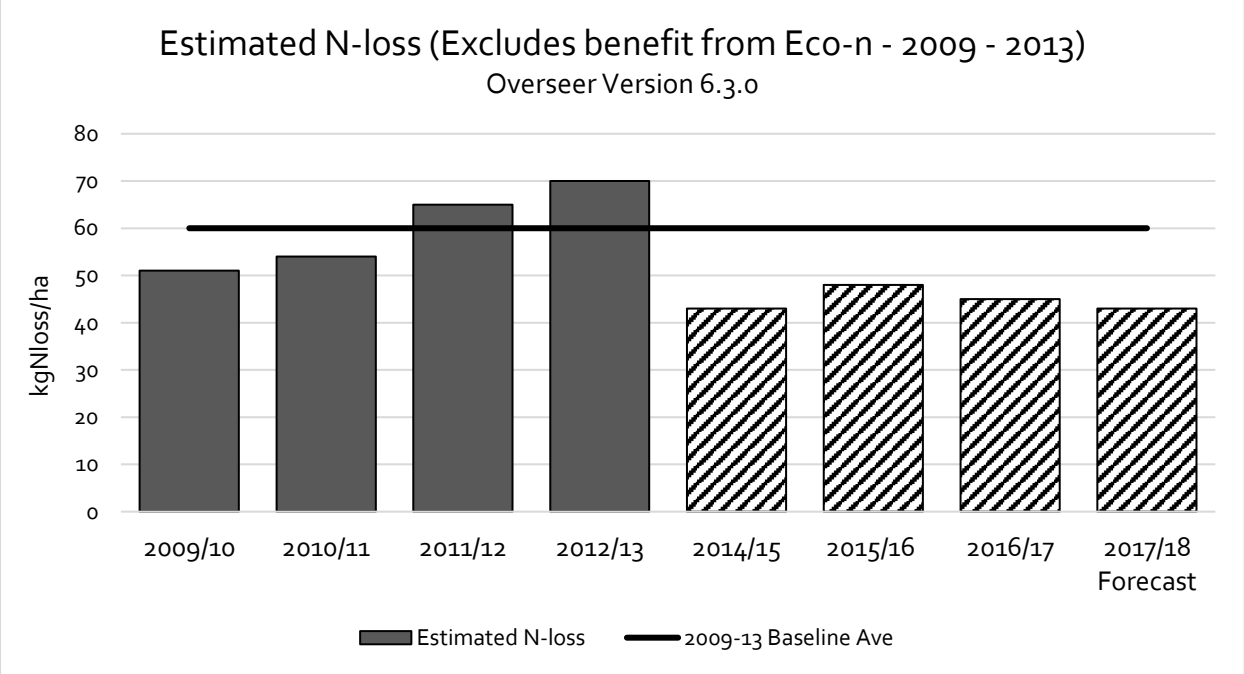
To achieve the above objectives, and considering the changing environmental regulations to reduce nutrient losses, LUDF has since the beginning of the 2014/15 season adopted and scaled up research emerging from the P21 Phase 2 programme. This research (jointly funded by the Ministry of Business, Innovation and Employment, DairyNZ, Fonterra, Beef + Lamb New Zealand and the Dairy Companies Association of New Zealand) identified a "low input, highly productive farming system" that reduced nutrient losses while maintaining profitability when estimated against the LUDF data at the time.

Following four years implementing (and refining) this system, the farm has achieved over 25% less nitrogen leached (as estimated with Overseer®) and excluding this season, has largely achieved the same profitability, if adjusted for payout, as the farm was previously generating.

	Average 11/12 - 13/14	**Average 14/15 - 16/17**	***2017-18 Forecast***
Peak cows milked	**631**	**557**	***558***
Stocking Rate	**3.9**	**3.5**	***3.5***
Total kgMS sold	291,414	284,916	*250,000*
Per Cow Milk Production	463	512	*450*
Milk Production /ha	1821	1781	*1563*
Total N fert applied kgN/ha	313	165	*178*
Total Imported Silage Fed tDM	273	153	*279*
Total Imported Silage Fed (kgDM/peak cow)	433	274	*500*
December Liveweight	475	490	*481*
kgMS/kg LWT	97%	104%	*94%*
Farm Working Expenses	$4.01	$3.70	*$4.14*
Overseer Est kgN Leached/ha (vers 6.3.0)	61	45	*43*
Total GHG emissions (CO_2 eq kg/ha/yr)	17,471	15,392	*14,285*

As seen in the summary of results above, LUDF has reduced its imported feed and N-fertiliser use, and through better matching of its stocking rate to feed supply, largely maintaining profitability. Estimated N-losses from Overseer® are shown below.

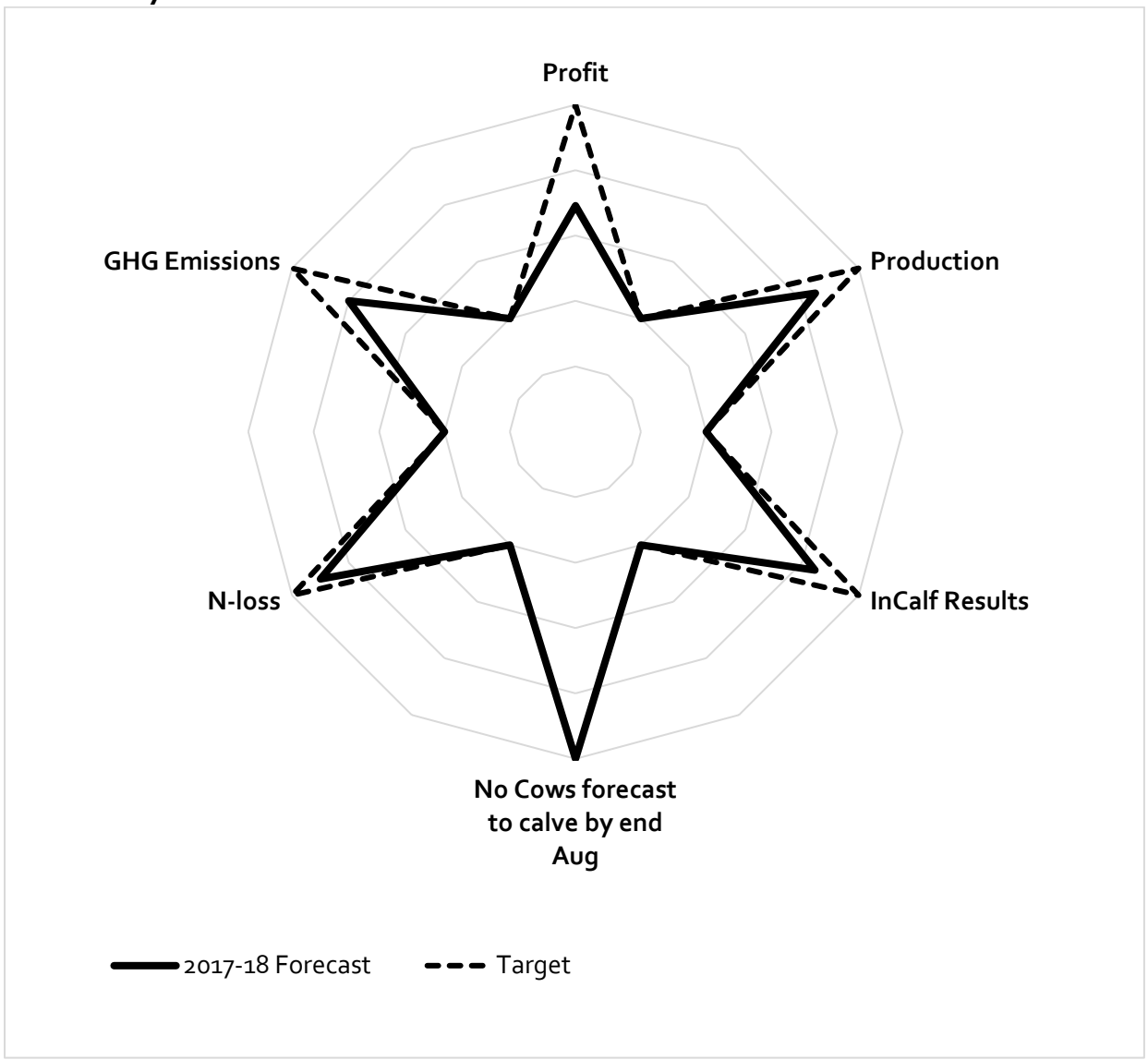


The forecast N-leaching losses (predicted using Overseer) for 2017-18 season is 28% below the farms 2009-2013 N-baseline.

RESULTS TO DATE (TO THE END OF APRIL 2018):

	2014/15	**2015/16**	**2016/17**	**2017/18**
Total kgMS sold	261,570 kgMS	274,970 kgMS	269,011 kgMS	238,774 kgMS
Total Cows in Milk	466	520	530	496
Total N fert applied	143 kgN/ha	179 kgN/ha	173 kgN/ha	178 kgN/ha
Tot Purch Sil Fed /cow	255 kgDM/cow	114 kgDM/cow	307 kgDM/cow	403 kgDM/cow
Total Purch. Silage tDM	143 tDM	63 tDM	171 tDM	225 tDM
Whole Herd WOW	512 kg	500 kg	507 kg	501 kg
Herd Ave CS	4.3	4.3	4.3	4.2
Silage made on farm (tDM)	22	154	58	49
Silage made on farm (kgDM/cow)	40	275	104	88

LUDF 2017-18 PERFORMANCE SCORECARD



Profit - below target - the result of low production

Production - below target - challenging growing conditions

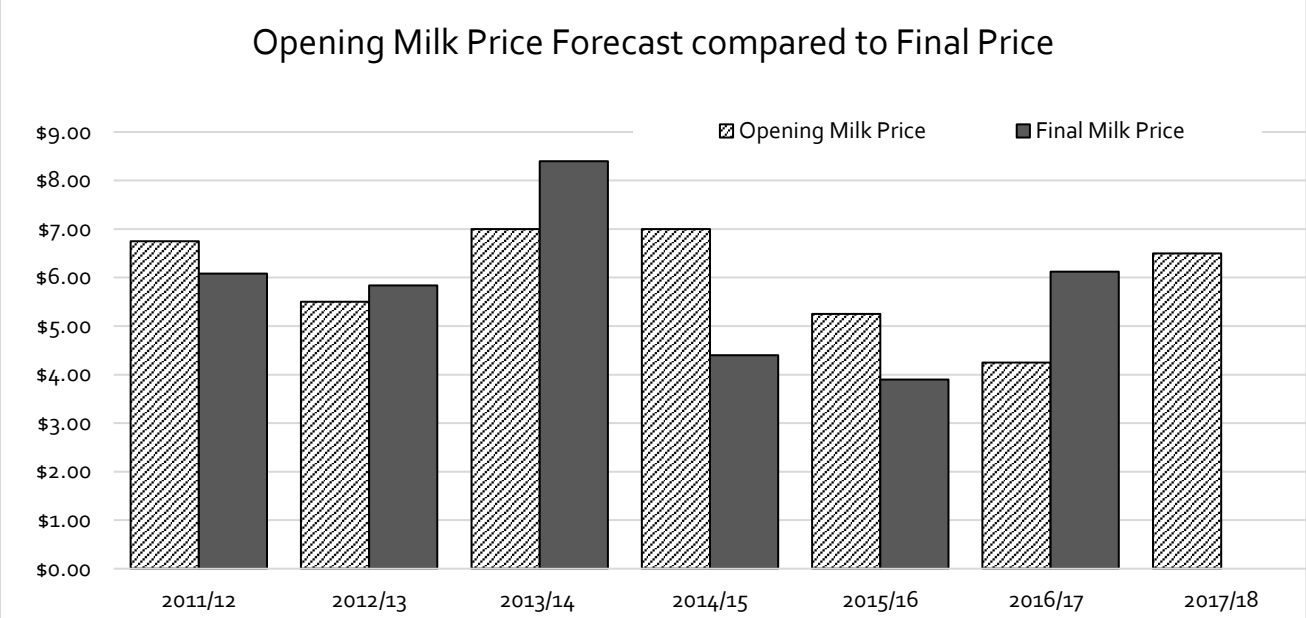
InCalf Results - improvement on 2016-17, but still below target with challenging empty rate

No Cows forecast to calve by the end of Aug (2018) - on target (much improved on past years)

N-loss - Close to 2022 target for Selwyn-Waihora

GHG emissions - below target

FARM PROFITABILITY: MILK PRICE



The Milk price (per kilogram milk solids) remains a key driver of farm profitability. Volatility in milk prices in recent years has reinforced the need to run an efficient farm system that can accommodate lower milk income while still capitalising on higher milk prices. It is useful to also keep in mind the variability that has occurred in recent years between the opening milk price and the final milk price.

2017-18 EXPENSES TO DATE / COMPARISON TO BUDGET.

The 2017-18 budget was developed in Autumn 2017 with a conservative milk price (at the time) of $6.00/kgMS + 30 cents /share dividend income. It was prepared on the basis of seeking to maintain the long term productivity of the farm in relation to soil fertility, herd quality and pasture performance. Similarly R&M was budgeted on the basis of maintaining the farms assets, noting the farm uses a calculated regular replacement policy for items like motorbikes that have been previously shown to incur little R&M in the first 2 years, but increasing costs and decreasing trade-in values in subsequent seasons.

Production was budgeted at just over 295,000kgMS, based on past production from 560 cows with limited bought in grass silage and nitrogen fertiliser, but with the addition of some fodderbeet to feed in the autumn. Dividend income is calculated on the assumption the farm holds one share for each kilogram milk supplied for the season.

Budgeted expenses were $1,114,105, up $38,000 from last years actual expenses, while budgeted production was also up nearly 9000kgMS, based on increased use of fodderbeet and thus autumn milk production. This results in budgeted farm working expenses of $3.77/kgMS.

EXPENSES TO DATE AND YEAR END FORECAST:

Year ending May 31	2016/17 Actual	2017/18 Budget	Actual to end April	Budget to End April	Variance (act-bud)	Forecast - Year End	Notes
Milk production (kgMS)	286,189	295,181	238,774	277,506	-38,732	250,000	1
160ha	1789 /ha	1845 /ha				1,563	
Peak Cow Nos and Prod.	555	560	558	560			
Income Payout $/kgMS	$6.12	$6.00	$6.55	$6.55		$6.55	
Dividend /share	0.40/share	0.30/share	$0.30/share	$0.30/share		$0.30/sh	
Milksolid Revenue	$1,751,477	$1,771,086	$1,563,967	$1,817,664	-253,697	1,637,500	1
Dividend	$114,476	$88,554	$71,632	$83,252	-11,620	75,000	2
Surplus dairy stock	$127,290	$112,961	$81,062	$112,959	-31,897	145,000	3
DairyNZ Levy	-$10,303	-$10,627	-$8,596	-$9,990	1,394	-$9,000	
Stock Purchases	-33,900	-24,000	-33,000	-24,000	-9,000	-33,000	4
Gross Farm Revenue	**1,949,039**	**1,937,975**	**1,675,066**	**1,979,885**	-304,819	**1,815,500**	
Expenses							
Cow Costs Animal Health	$74,535	$62,304	$57,447	$59,591	-$2,144	$58,200	5
Breeding Expenses	$43,546	$47,634	$50,224	$48,673	$1,551	$50,224	6
Replace. grazing & meal	$144,462	$143,504	$130,309	$124,745	$5,564	$143,686	7
Winter grazing - incl. freight	$152,769	$159,575	$150,427	$154,103	-$3,676	$163,118	8
Feed Grass silage purch.	$74,849	$74,928	$91,042	$63,628	$27,414	$92,000	9
Silage making on farm	$6,926	$18,240	$5,832	$16,320	-$10,488	$5,832	10
Giberillic Acid	$0	$6,560	$0	$6,560	-$6,560	$0	11
Nitrogen	$38,597	$48,470	$41,404	$48,453	-$7,049	$41,404	12
Fertiliser & Lime	$32,343	$26,240	$30,648	$26,257	$4,391	$30,648	13
Irrigation - All Costs	$82,017	$83,600	$44,520	$74,000	-$29,480	$44,520	14
Re-grassing	$11,762	$20,215	$10,540	$20,215	-$9,675	$11,720	15
Staff (net of housing)	$248,264	$255,429	$221,591	$232,598	-$11,007	$247,929	16
Land Electricity-farm	$28,011	$30,000	$25,730	$27,200	-$1,470	$28,630	
Administration	$25,035	$24,700	$19,962	$22,471	-$2,509	$23,090	
Rates & Insurance	$21,020	$21,020	$21,020	$21,020	$0	$21,020	
Repairs & Maintenance	$61,297	$50,000	$32,903	$56,292	-$23,389	$44,000	17
Shed Expenses excl. power	$8,685	$9,850	$9,110	$9,850	-$740	$11,022	
Vehicle Expenses	$21,184	$31,336	$16,414	$31,336	-$14,922	$18,231	18
Weed & Pest	$1,223	$500	$278	$500	-$222	$500	
Cash Farm Work Expenses	**1,076,525**	**1,114,105**	**$959,401**	**1,043,812**	-$84,411	**1,035,774**	19
FWE/kgMS	**$3.76**	**$3.77**				**$4.14**	
Depreciation est.	$116,000	$116,000				$116,000	
Total Operating Expenses	1,192,525	1,230,105	$959,401	1,043,812	-$84,411	1,151,774	
Dairy Operating Profit	$756,514	$707,870				$663,726	
DOP/ha	**$4,728**	**$4,424**				**$4,148**	
Cash Operating Surplus	$872,514	$823,870				$779,726	
Cash Operat. Surplus /ha	**$5,453**	**$5,149**				**$4,873**	

NOTES TO EXPENSES TO DATE AND YEAR END FORECAST:

1. Effect of 14% less milk production (than budgeted) at end April and forecast 15% less than budget at year end. Higher milk price is helping offset lower production. Production to date is 12% behind last years'.
2. Effect of less milk production (LUDF assumes one share is held for every kilogram MS produced for dividend comparisons)
3. Less stock sales (than budgeted) to end April influencing actual sales to date, but receiving higher prices than budgeted for cull cows and received higher prices than budgeted for surplus calves.
4. Incorrectly budgeted stock purchases (bulls).
5. Includes CS monthly - approx. $5000 to date, offset with no DCP this autumn, more on trace minerals and lameness.
6. More AI, less Bull costs
7. $7500 more on milk powder
8. Reduction in August grazing but early calving light condition score cows are grazing off farm in May
9. Budgeted to purchase fodderbeet in the autumn, purchased grass silage instead at same price (per kgDM) but have purchased more silage than budgeted.
10. Less silage made on platform
11. GA not used this season
12. Lower N price than in budget
13. More maintenance fertiliser (based soil tests)
14. RM left pivot inoperable for too much of early season (decreasing electricity costs for irrigation).
15. Regrassing 5% farm not 10%, but 8 ha undersowing following grazing at the end April / early May.
16. Gap in employment of permanent staff.
17. Less maintenance than budgeted, but includes pivot ruts to be filled later this autumn
18. Less fuel, lower costs with new ute and bikes.
19. Forecast year end expenses are approximately $84,000 less than budgeted, but with lower production expenses per kg milksolids are forecast to be nearly 40 cents /kgMS higher than budgeted.

SENSITIVITY TO PRODUCTION.

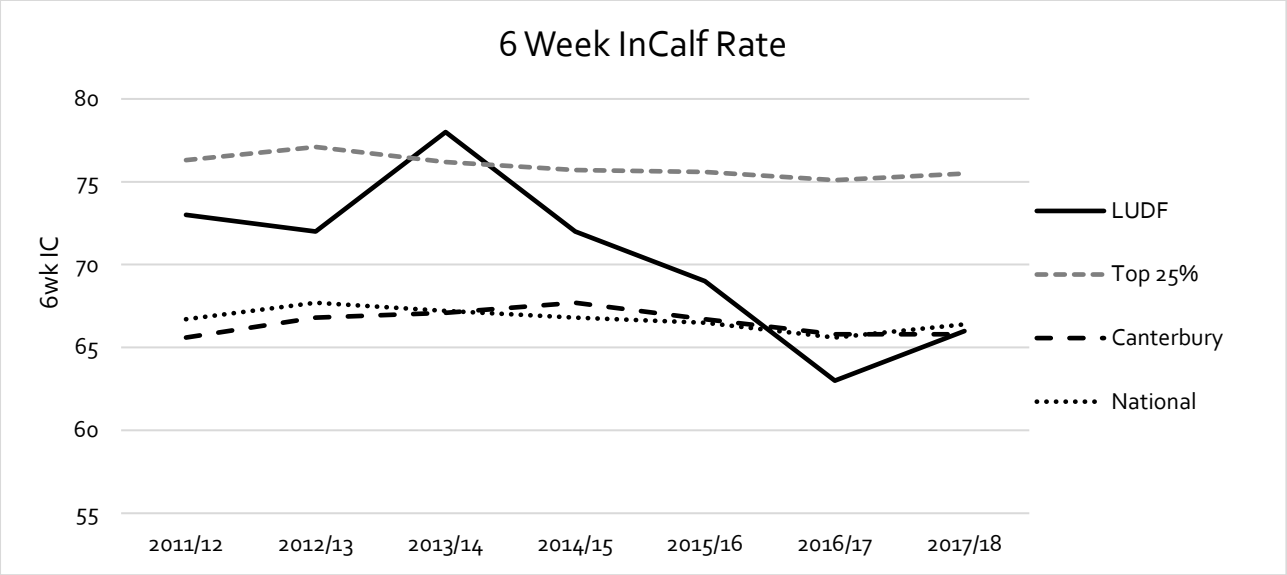
Note the farms budget is very sensitive to production. The year-end forecast of 15% lower production has a major impact on expenses per kg milksolids, and profitability per hectare.

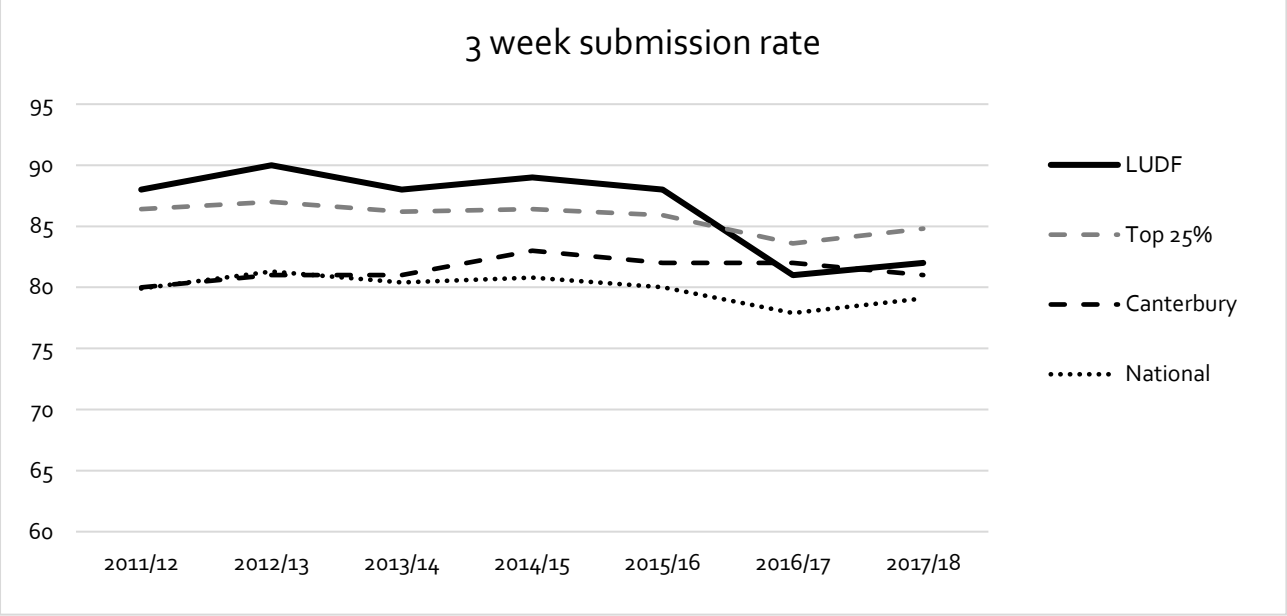
	Budgeted Production and Exps.	Forecast Production and Expenses
Total Milk Production	**295,181**	**250,000**
Variance in production	(as budgeted)	-15%
Total Expenses	$1,114,105	$1,035,774
Milk Production /cow	527	448
Expenses /kgMS	$3.77	$4.14

REPRODUCTIVE PERFORMANCE - 2017 MATING RESULTS:

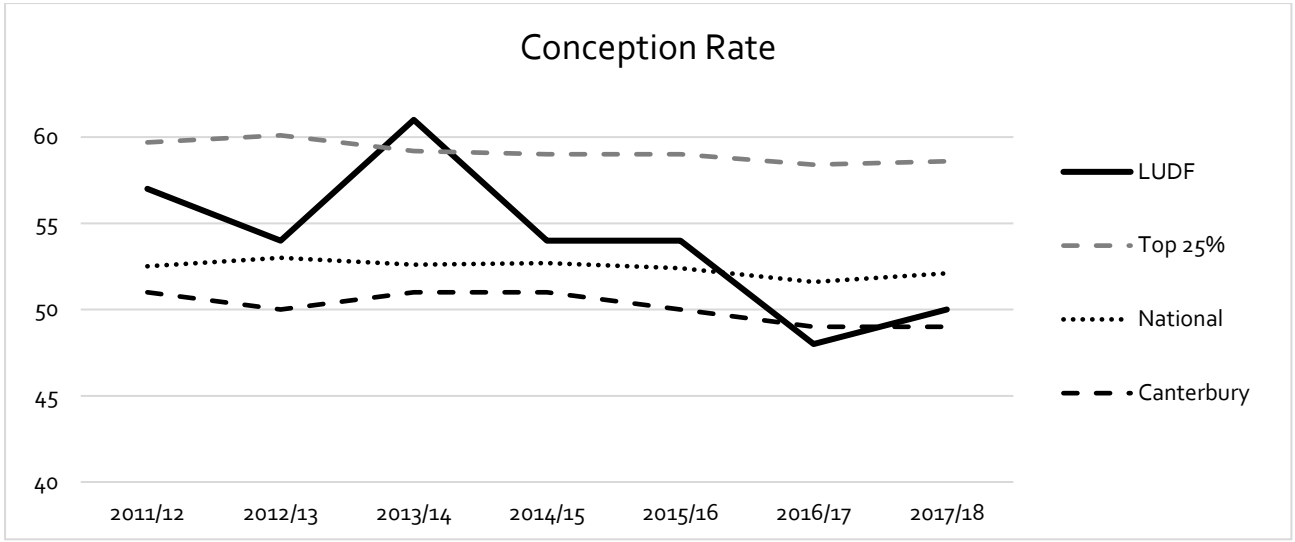
(Thanks to LIC for providing the following analysis)

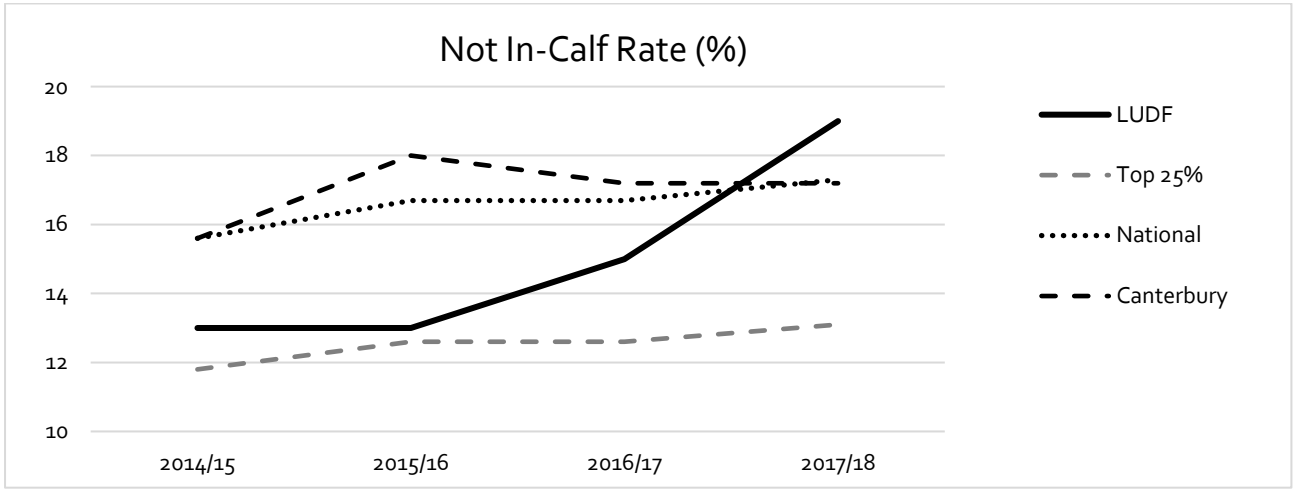
COMPARISONS OVER TIME - ACROSS THE INDUSTRY:

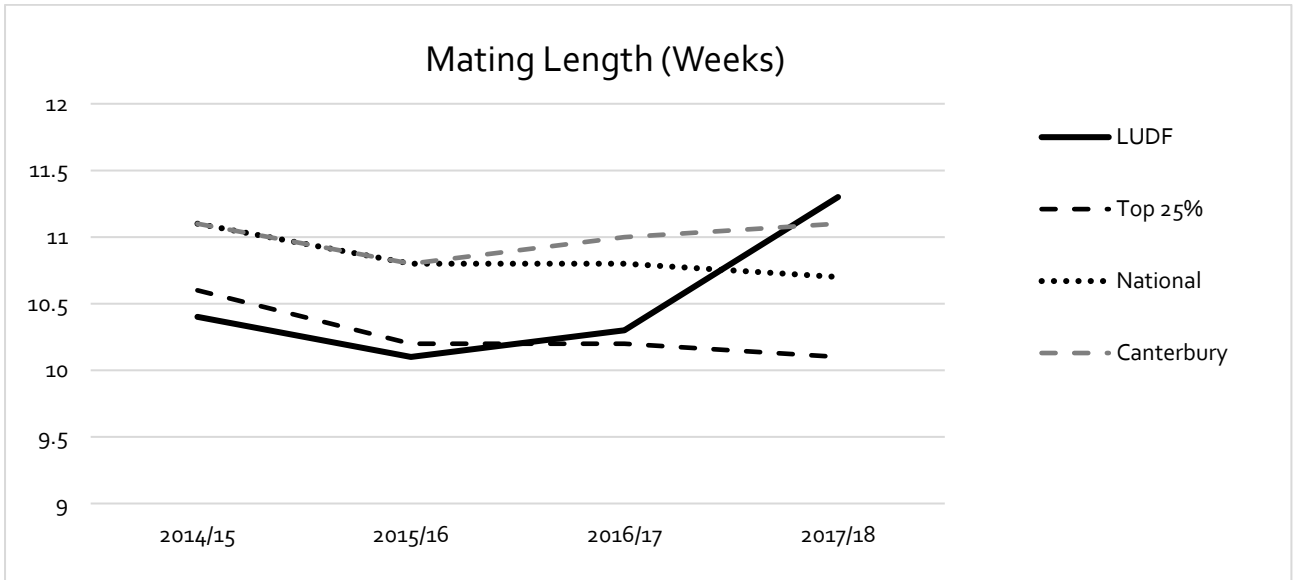




Note - in these datasets, the top 25% is from the National data set, not the top 25% in Canterbury. Data is interim data available at the end of April 2018.



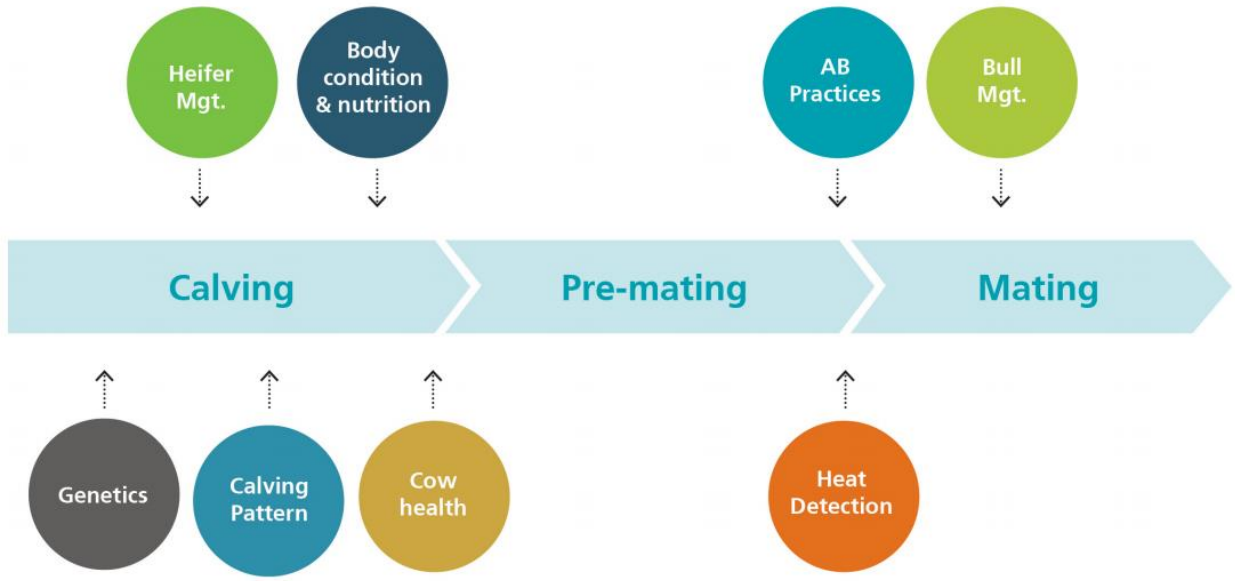




Not In-Calf Rates should be considered in relation to total mating length.

ANALYSIS OF MATING RESULTS - SPRING 2017:

We will look at this season's performance by using the eight areas of the Fertility Cake as shown in the recently released second edition of the DairyNZ InCalf Book as reference:



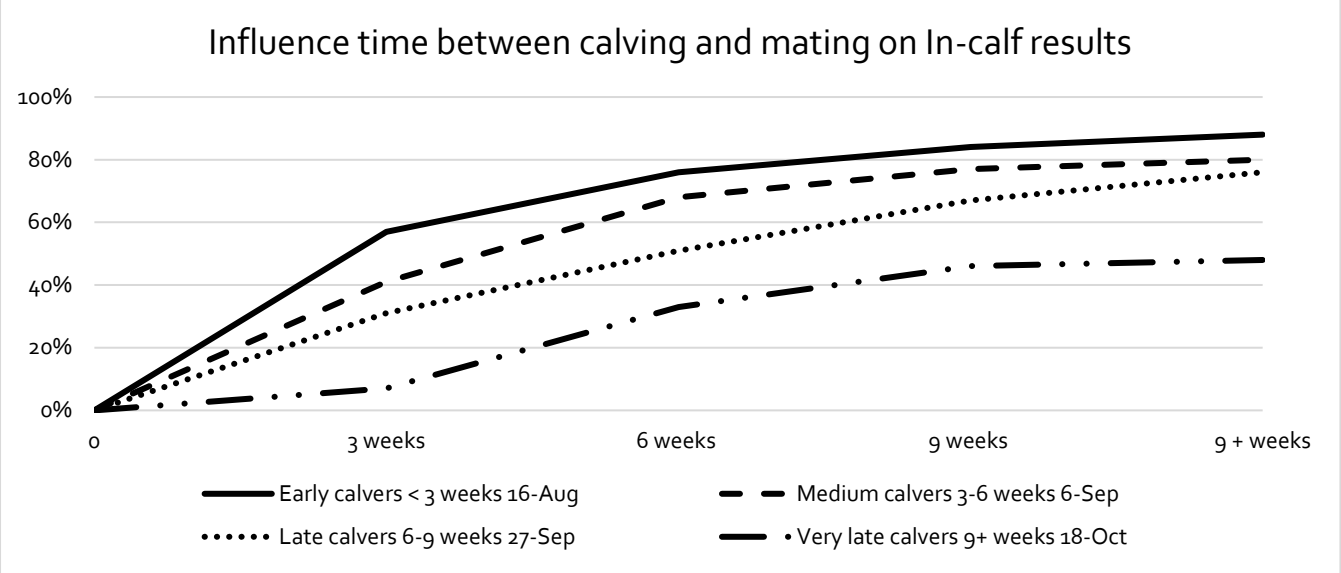
But will also cover a few different points that are also of interest. Comments on how each of those areas affected the overall herd performance are made below:

1. **Calving pattern –** Last year's poor mating performance meant that the calving pattern was always going to be a challenge for this seasons mating. Added to that, the decision to bring mating forward by one week also had an impact on the mating results of the herd as we, effectively, took time away from the cows to recover.

The fertility focus report identifies late calvers are likely to have negatively impacted in-calf rates. In 2017, the herd had only 47% of the herd calved by week 3 (compared to the target of 60%), 72% by week 6 (vs target of 87%) and 92% by week 9 (vs target of 98%).

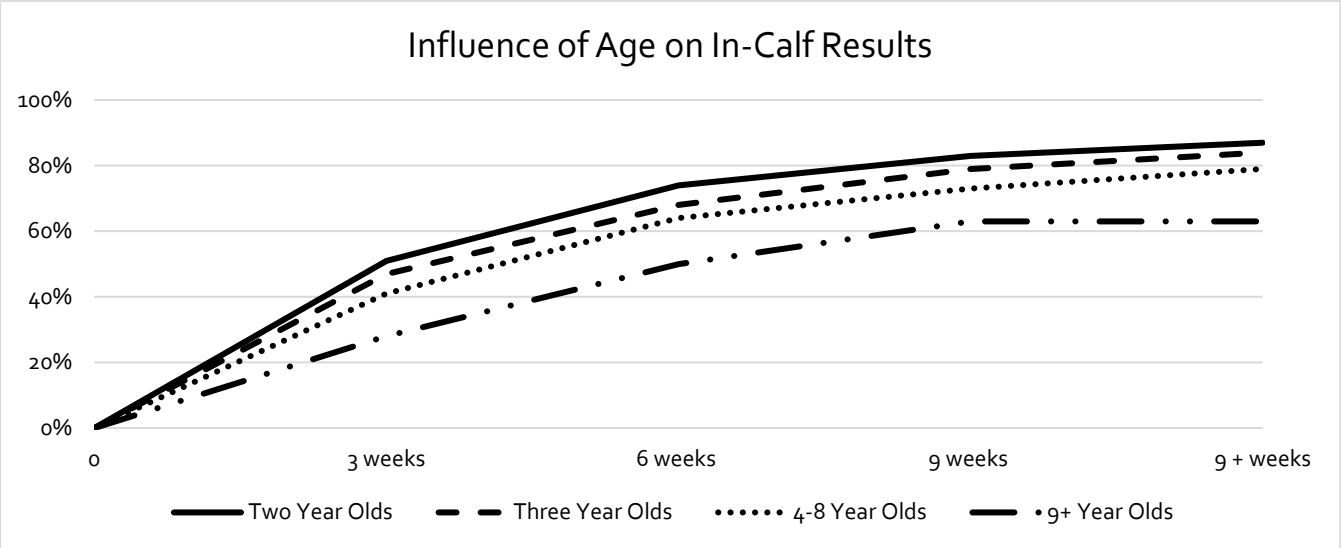
The influence of calving pattern on reproductive performance is evidenced by the graph below. For example, of the 108 cows calving between 27 September and 18 October, 1/3 had not conceived by the end of 9 weeks mating, and 24% were still not in calf after 11 weeks mating.

Calving Pattern			Number / % herd		In Calf Rate				Not In Calf rate (after 11 weeks mating)
					3 wks	6 wks	9 wks	9+wks	
Early calvers	< 3 wks	16-Aug	**260**	**47%**	57%	**76%**	84%	88%	**12%**
Medium calv.	3-6 wks	6-Sep	144	26%	41%	68%	77%	80%	20%
Late calvers	6-9 wks	27-Sep	108	19%	31%	51%	67%	76%	24%
Very late calvs	9+ wks	18-Oct	46	8%	7%	33%	46%	48%	52%



2. **Heifer Management** – The recorded weights for the 2015 born show that these animals were grown above target all the way through to calving. This is further evidenced by the production performance of this group which achieved 82% of the mixed aged cow production in the herd. These results are an indication of good transition and lactation management of this group. Their reproductive performance also supports that with a 6 week in-calf rate of 74% and a not in-calf rate of 13% for 11 weeks of mating. The expected NICR for this group is 15% when taking into account 6 week in-calf rate and mating length.

Age Group	Number / % Herd		In Calf Rate				Not in Calf-rate
			3 weeks	6 weeks	9 weeks	9+wks	
Two Year Olds	133	24%	51%	74%	83%	87%	13%
Three Year Olds	117	21%	47%	68%	79%	84%	16%
4-8 Year Olds	254	46%	41%	64%	73%	79%	21%
9+ Year Olds	54	10%	28%	50%	63%	63%	37%

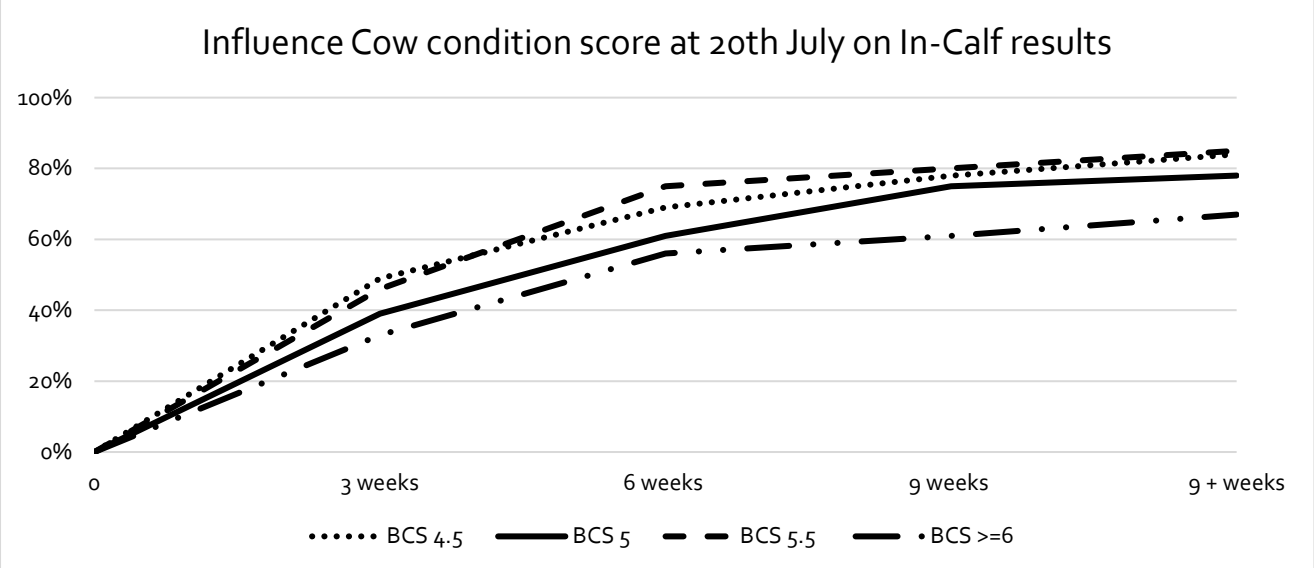


3. **Management of two year olds (R3yr) during their first lactation / Second winter as pregnant cow (2016-17 and winter 2017)** - The 2014 born (R3's) should have had better overall reproductive performance (see above). The BCS data recorded on the 20th July 2017 suggests that as a group they were not at BCS target of 5.5 at that time, instead, averaging 4.9. Only 20 cows were at BCS target at this time approximately 2 weeks prior to the start of calving. Reaching BCS targets at Calving is essential to maximise both reproductive and productive performance. From a production point of view, they achieved almost 90% of the mature cows which is the target for this age group.

4. **Body Condition Score** – best practice states that there should be no more than 15% of cows above or below calving targets, whereas LUDF had 35% of animals below target, two weeks prior to the start of calving. While only 6% of the herd were at CS 6 or above, these cows clearly had lower reproductive performance. Cows at CS 5 at 20th July represent nearly half of the total herd and have slightly poorer in-calf results than the whole herd. As a group, cows at CS 4 or 4.5 at 20th July had better reproductive results than those at CS 5, however some of these cows would have been still increasing CS at this point and are likely to have been at target CS when they calved.

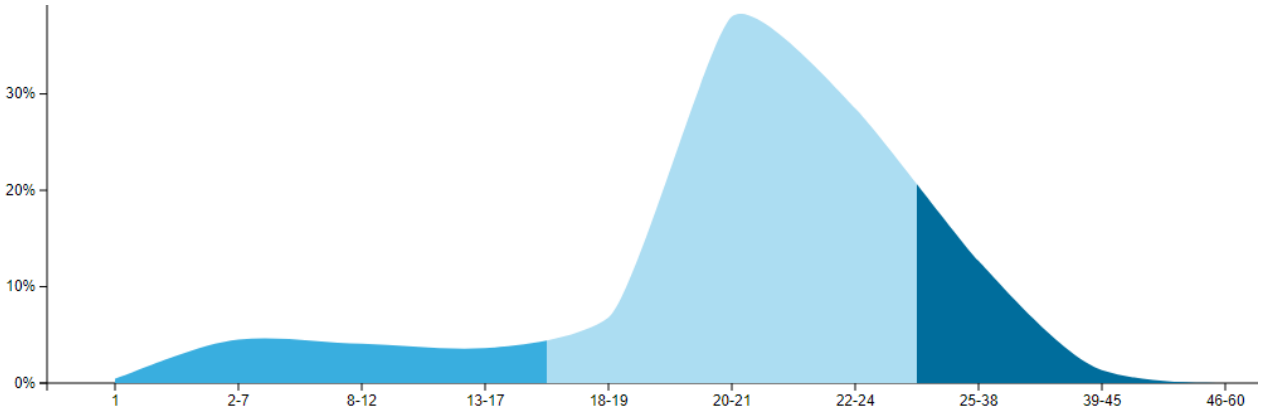
BCS at 20th July	Number / % Herd		In Calf Rate				Not in Calf-rate
			3 weeks	6 weeks	9 weeks	9+wks	
BCS 4	38	7%	53%	68%	76%	87%	13%
BCS 4.5	159	28%	49%	69%	78%	84%	16%
BCS 5	233	42%	39%	61%	75%	78%	22%
BCS 5.5	91	16%	46%	75%	80%	85%	15%
BCS >=6	36	6%	33%	56%	61%	67%	33%

There was no measurable difference in mating results for cows when compared with the rate of BCS loss from calving to the end of September, though the data is influenced by the rate of calving and influence of this on condition score (i.e. earlier calving cows may have lost more CS at the end of September but have had more time between calving and mating and this may override any CS loss impact).



5. **Nutrition** – this is the least "visible" ingredient to assess. We saw a drop in the rate of cows getting pregnant on the 9th November and 29th November, coinciding with the end of the 1st and 2nd rounds of AB. Milk production per cow was stable through the late October / November period but began declining from the end of November. Changes in grass intake, quality and or composition which, ultimately, are seen in the herd as drop in milk production are potentially also contributing factors to drops in reproductive performance.

6. **Heat detection** – The data supports excellent performance on this ingredient. Perfect looking RIA (return interval analysis) graph.



	Interval	Actual	Target
Short	1-17 days	13%	< 13%
Normal	18-24 days	73%	>= 69%
Long	25+ days	14%	< 10%

7. **Cow Health –** cows with uterine infection (2%) and mastitis (6%) had poorer reproductive performance than animals not affected.

8. **AB practices –** Conception rates in early calving cows was 58% compared to 31% on the very late cows so one can conclude that AB practices didn't affect performance.

9. **Genetics –** The LUDF herd data indicates a small advantage in reproductive performance for cows with higher BW.

Whole herd - BW	Count / %	3 Week Submission Rate		Pregnancy Rate			
				3 Wks	6 wks	9 wks	9+ wks
135 and over	119 / 21%	103	87%	48%	68%	80%	86%
110 to 135	121 / 22%	98	81%	45%	68%	80%	82%
90 to 110	115 / 21%	100	87%	42%	68%	75%	78%
70 to 90	102 / 18%	76	75%	39%	62%	74%	80%
Below 70	101 / 18%	81	80%	41%	59%	66%	72%
Total	558	458	82%	43%	65%	75%	80%

When comparing Production Worth (PW) and Lactation Worth Indices, high PW cows had slightly lower reproductive performance while lactation worth data gave mixed results.

Whole herd - PW	Count / %	3 Week Submission Rate		Pregnancy Rate			
				3 Wks	6 wks	9 wks	9+ wks
200 and over	125 / 22%	100	80%	42%	62%	77%	78%
150 to 200	107 / 19%	84	79%	37%	62%	74%	79%
105 to 150	106 / 19%	96	91%	47%	70%	78%	82%
60 to 105	107 / 19%	91	85%	47%	70%	77%	84%
Below 60	113 / 20%	87	77%	42%	63%	71%	77%
Total	558	458	82%	43%	65%	75%	80%

Whole herd - LW	Count / %	3 Week Submission Rate		Pregnancy Rate			
				3 Wks	6 wks	9 wks	9+ wks
230 and over	109 / 20%	87	80%	43%	61%	72%	74%
160 to 230	112 / 20%	91	81%	48%	72%	82%	87%
115 to 160	105 / 19%	89	85%	41%	65%	73%	76%
40 to 115	112 / 20%	93	83%	47%	65%	77%	83%
Below 40	120 / 22%	98	82%	37%	63%	72%	79%
Total	558	458	82%	43%	65%	75%	80%

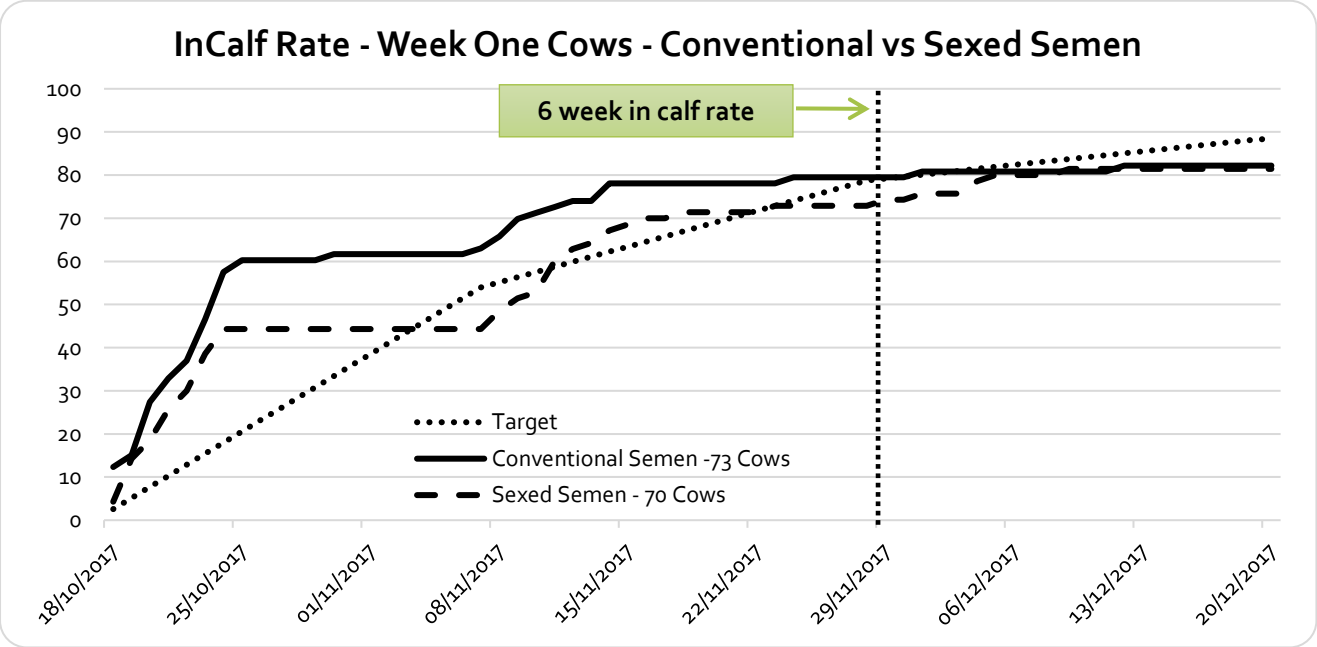
10. **Bull Management –** The graph doesn't show any big improvement or decrease in the rate of cows getting pregnant once they joined the herd. There were 171 cows yet to be pregnant by the time the bulls went out. LUDF had 20 bulls on farm rotated daily. 171 cows/ 3 weeks = 8 cows /day and 10 bulls.

11. **Milk production (kgMS by quartile - based on 1st 3 herd test results)** – please note that 23 cows were culled before running this report hence the difference in numbers below. High producing cows this season (based on total herd tests) had slightly better overall reproductive results than lower producing cows.

Production Quartile - kgMS	Count / %	3 Week Submission Rate		Pregnancy Rate			
				3 Wks	6 wks	9 wks	9+ wks
Top Quartile	134 / 25%	115	86%	50%	72%	81%	83%
2nd Quartile	134 / 25%	101	75%	40%	65%	74%	80%
3rd Quartile	134 / 25%	120	90%	50%	67%	76%	82%
Bottom Q.	134 / 25%	108	81%	38%	63%	77%	82%
Total	535	444	83%	44%	67%	77%	82%

12. **Non-Cycling cows** – We didn't achieve 3 week submission rate target of 90% (actual was 82%). 89% of cows were submitted by week 4 indicating the target would have almost been achieved had mating date remained the same as past years. Overall 96% of cows were submitted for AB during the total 7 weeks of AI mating.
13. **Frozen Sexed Semen Trial performance / change in start to mating date**. Sexed semen was used only in the first week of mating (one week earlier than normal planned start mating). The results for LUDF are as follows:

- 143 cows were mated in the first week of which 70 were mated to sexed semen and 73 to conventional semen. 44% of the sexed semen cows conceived (31 animals) compared to 58% (42 animals) from the conventional product that week. The Frozen Sexed Semen Trial results showed that there was a difference of 12.5% in conception rate between the conventional semen and sexed semen which supports the result obtained by Lincoln.
- Had the farm not used sexed semen, its possible a further 9 cows may have been in calf at the end of the first week. This difference in performance translated into a 6 week in-calf rate (for the week one cows), of nearly 80% for the conventional semen compared to 73% for sexed semen. Note both groups reached a similar in-calf rate by the end of 7 weeks.



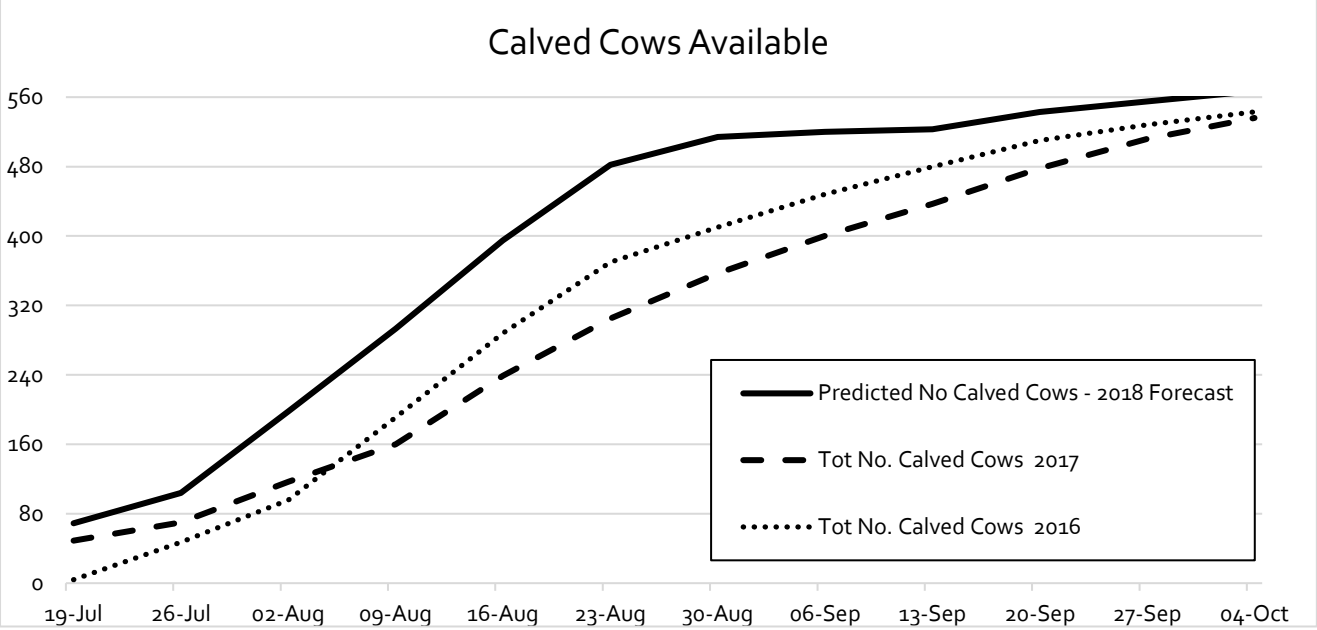
We expect that 28 heifers will be born from the sexed semen matings against 20 from the conventional semen. The difference in cost for the straws is roughly $40 x 70 = $2800. Assuming 9 less cows pregnant from the first round of AB, the cost of missed production is 9 x 21days x 1.8kgMS/day x $6 = $2041 giving a total increased cost of $4841. When we divide this by the extra 8 heifers born, we have an extra cost of $605 per heifer, plus 2% fewer cows in calf in the first 3 weeks.

Offsetting these costs, in this season however, is the acknowledgement the farm only choose to mate early because of the use of sexed semen, and its potential impact on conception rates. It is likely to benefit from extra milk from all cows mated one week earlier - ie 31 + 42 = 73 cows that will calve in week 'minus 1' and would otherwise have calved in week 3. LUDF has therefore potentially gained 3 weeks milk from these animals - at 1.8kgMS/cow/day x $6 x 21 days x 73 = $16,556 gross income achieved by mating these cows earlier than normal.

In practice this is a partial system change, which may be beneficial for LUDF with its lower stocking rate and increased use of hybrid ryegrasses with greater cool season growth potential. Additionally, starting to mate one week earlier allows either a non-hormonal 'why-wait' outcome, and or use of longer gestation semen for specific cows without impacting calving pattern.

Summary:

1. Nearly half the herd met industry targets for InCalf results - these were the early calving cows.
2. Heat detection and AB practices have contributed positively to incalf results.
3. Its difficult to draw conclusions around CS, production or bull management on reproductive performance at LUDF this season.
4. Despite the poor reproductive performance achieved in the 2016/17 season and resulting calving spread, and the change in mating start date, InCalf rates have still increased from 63% to 66%.
5. Not In-Calf rate was only 1% higher than the expected value based on the updated InCalf targets.
6. Significantly, the combination of an earlier start to mating and use of short gestation semen indicates a substantial improvement in the expected calving pattern compared to the last 2 seasons:



Fertility Focus 2017: Seasonal

Lincoln University
The Manager (University Dairy Farm) Hancox

Report date:	14/02/18
PTPT:	BQCY
Herd Code:	6/114
No of cows included:	558
These cows calved between:	10/06/17 and 16/12/17
Mating start & end date: (based on AB or pregnancy test data)	18/10/17 - 04/01/18
Next planned start of calving:	27/07/18
Duration of mating:	79 days
Duration of AB period:	49 days

incalf FERTILITY FOCUS
Version 2.15

DairyNZ

LIC

1 Overall herd reproductive performance

6-week in-calf rate
Percentage of cows pregnant in the first 6 weeks of mating

Your herd	66%
Aim above	78%

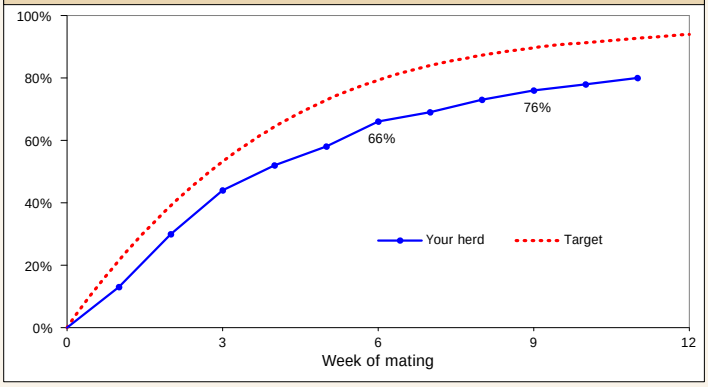
☆

Not-in-calf rate
Percentage of cows not pregnant after 79 days of mating

Your herd	19%
Aim for	6%

☆

% of herd in calf
Cumulative by week of mating



2 Drivers of the 6-week in-calf rate

3-week submission rate
% of cows that were inseminated in the first 3 weeks of mating

Your herd	82%
Aim above	90%

☆☆☆

Non-return rate
% of inseminations that were not followed by a return to heat

Your herd	
Aim above	

Conception rate
% of inseminations that resulted in a confirmed pregnancy

Your herd	51%
Aim above	60%

☆

3 Key indicators to areas for improvement

Calving pattern of first calvers
Well managed heifers get in calf quickly and calve early.

Calved by	Week 3	Week 6
Your herd	88%	97%
Aim above	75%	92%
	☆☆☆☆☆	☆☆☆☆☆

Calving pattern of whole herd
Did late calvers reduce in-calf rates?

Calved by	Week 3	Week 6	Week 9
Your herd	47%	72%	92%
Aim above	60%	87%	98%
	☆	☆	☆☆☆

Pre-mating heats
A high % of well managed cows will cycle before the start of mating.

Your herd	61%
Aim above	85%

☆

3-week submission rate of first calvers
Well managed heifers cycle early

Your herd	91%
Aim above	90%

☆☆☆☆☆

Heat detection
A high % of early-calved mature cows should be inseminated in the first 3 weeks of mating.

Your herd	91%
Aim above	95%

☆☆☆

Non-cycling cows
Treated non-cyclers get in calf earlier.

Treated	By MSD	Wks 1-3	Wks 4-6
Your herd	0%	0%	0%

Rating	What does it tell me?	What should I do?
☆☆☆☆☆	Top result	Ideal - keep up the good work!
☆☆☆	Above average	Getting there - focus on getting the details right.
☆	Below average	Plenty of room to improve - seek professional advice.
	No result	Not enough information provided - seek help with records.

Performance after week 6
Expected not-in-calf rate helps assess management affecting performance after week 6 (including bull management and herd nutrition).

Not-in-calf rate

Your herd	19%
Expected	10%

Seek advice

Behind Your Detailed Fertility Focus Report

Version 2.15

Report period: Cows calved between 10/06/17 and 16/12/17.
This was the most recent period with sufficient herd records that enabled an analysis to be completed.

Calving system: Seasonal
Your herd has been classified as seasonal calving because most calvings occurred in a single batch lasting less than 21 weeks.

Level of analysis: Detailed.
Your good record keeping means a detailed analysis was possible for your herd.

Report date:	14/02/18
PTPT:	BQCY
Herd Code:	6/114
Calvings up to this date requested for analysis:	13/02/18
No of cows included:	558
These cows calved between:	10/06/17 and 16/12/17
Mating start & end date: (based on AB or pregnancy test data)	18/10/17 - 04/01/18

Part A) Herd records cross check

Check that the herd records in the table are complete and correct.

2017/18	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
No. of calvings		114	261	147	36								558
No. of AB matings					324	408	35						767
No. of preg tests								553	172				725
No. of non-aged/late aged positive preg tests													0
No. of cows culled or died						1	2						3

Part B) Notes on the calculations

Use the following notes to see how your results were calculated.

1 Overall herd reproductive performance

6-week in-calf rate

Your report has been based on the mating and pregnancy test results you supplied. The ACTUAL 6 week in-calf rate is shown for your herd.

Records available for not-in-calf rate

Recorded pregnant	448
Recorded empty	101
Doubtful/recheck*	4
Culled without pregnancy test	3
No record of cull or pregnancy test	2
Cows analysed	558

*Includes cows whose most recent empty diagnosis was less than 35 days after mating end date.

2 Drivers of the 6-week in-calf rate

3-week submission rate

558 cows had calving dates in the required range and were not culled before day 21 of mating and 82% of these were submitted during the first 21 days of mating.

Non-return rate

Non-return rate is not calculated when pregnancy test results provide an accurate estimate of conception rate.

Conception rate

The conception rate was calculated for 761 AB inseminations on and between 18.10.17 and 05.12.17.

3 Key indicators to areas for improvement

Calving pattern of first calvers

129 cows with eligible calving dates were recorded as calving at less than 34 months of age. The calving pattern of first calvers was calculated from their records.

Calving pattern of whole herd

558 cows had calving dates that were eligible for this report.

3-week submission rate of first calvers

129 first calvers had calving dates in the required range and were not culled before day 21 of mating and 91% of these were submitted during the first 21 days of mating.

Heat detection

136 cows at least 4 years old at calving had calved at least 8 weeks before mating start date and were not culled before day 21 of mating and 91% of these were submitted during the first 21 days of mating.

Pre-mating heats

558 cows had calving dates in the required range and were not culled before day 21 of mating and 343 of these had a pre-mating heat recorded.

Non-cycling cows

558 cows had calving dates in the required range and were not culled before day 21 of mating and 1 of these were identified as being treated for non-cycling.

Performance after week 6

Your herd's not-in-calf rate and 6-week in-calf rate were used to determine the success of your herd's mating program after the first six weeks. If bulls were used after week 6 of mating, this gives an assessment of how well they got cows in calf.

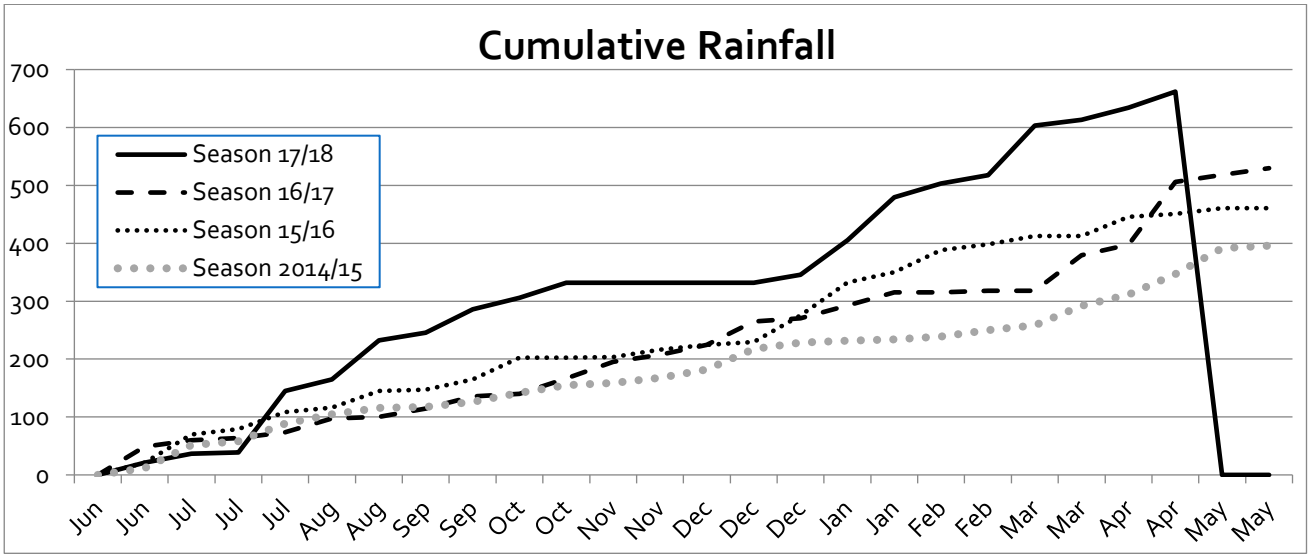
Induced cows

No cows were identified as having induced calvings. If cows were induced, ensure all inductions are recorded.

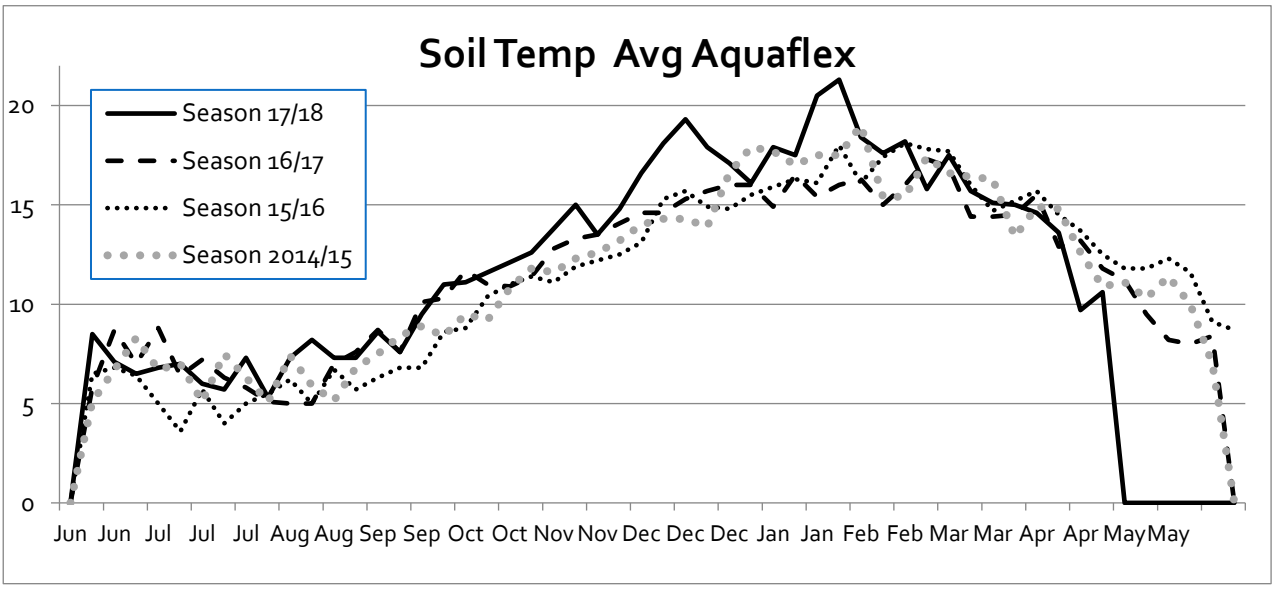
LUDF – OVERVIEW OF SEASON TO DATE

The 2017-2018 season has been characterized by somewhat extreme weather patterns, starting with a very wet July/August, making calving a challenge and followed by very hot and dry November/December with intermittent rainfall events from January onwards. These rainfall event were 2-3 days long each time with large amounts of rainfall. Last but not least, a strong southerly storm in mid-April that lasted 3 days with large snowfall on the hill meant a drop in temperatures from then on. This has caused challenges in terms of maintaining pasture quality and cows having the best environment for milk production.

Graph 1 - Cumulative Rainfall



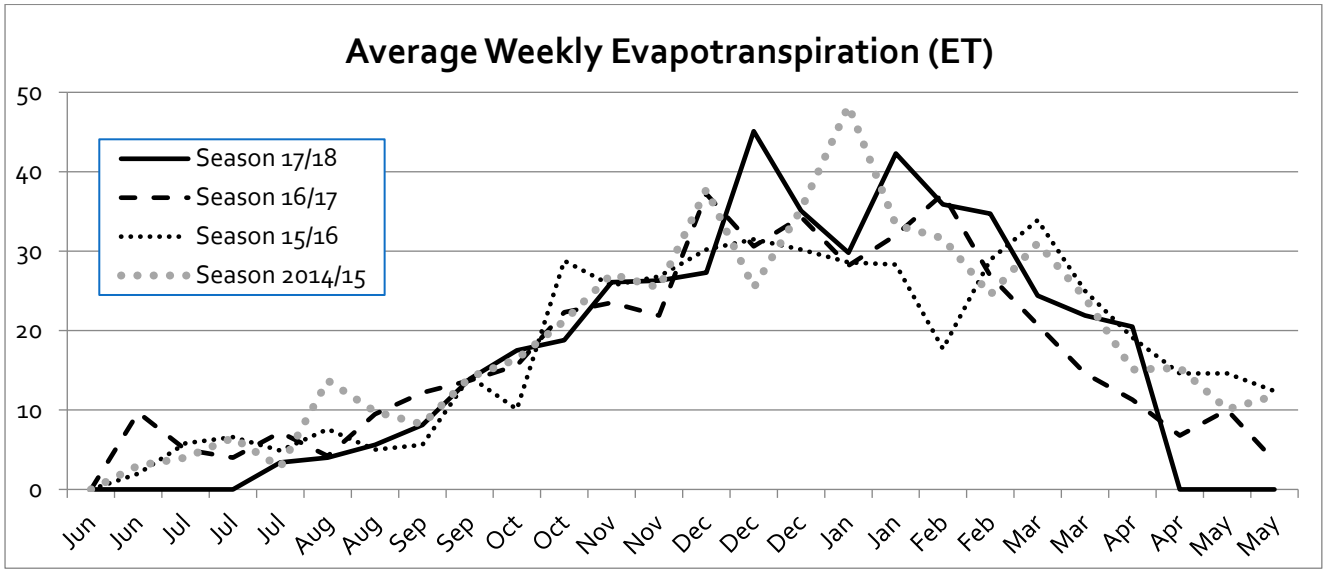
Graph 2 - Weekly Average Soil Temperature



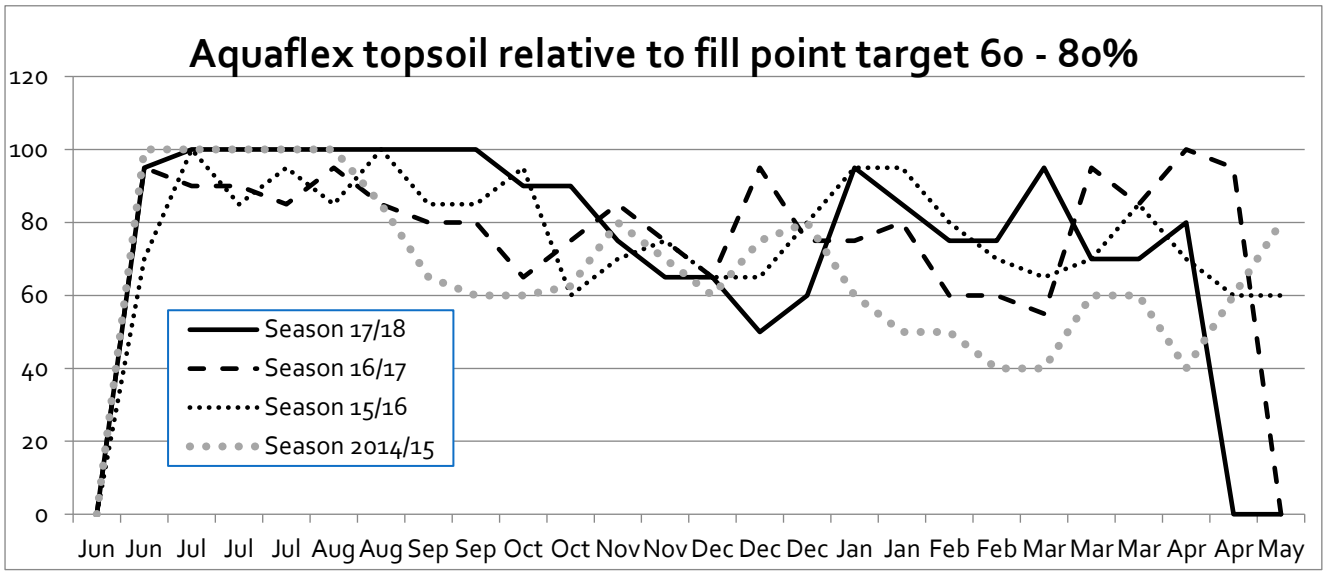
The high soil temperatures during November through to January are in part the result of much higher night time temperatures. Higher night time temperatures and high daytime temperatures increased evapotranspiration (ET) rates as plants use more moisture in the warmer weather. The irrigation infrastructure on LUDF can apply up-to 35mm irrigation water / week (in applications of 5mm/day) so cannot maintain soil moisture levels when ET is above 35mm/week.

On the other hand, the weather patterns received from January onwards (southerly storms of various levels of importance and length) clearly show the temperatures and ET's dropping during autumn.

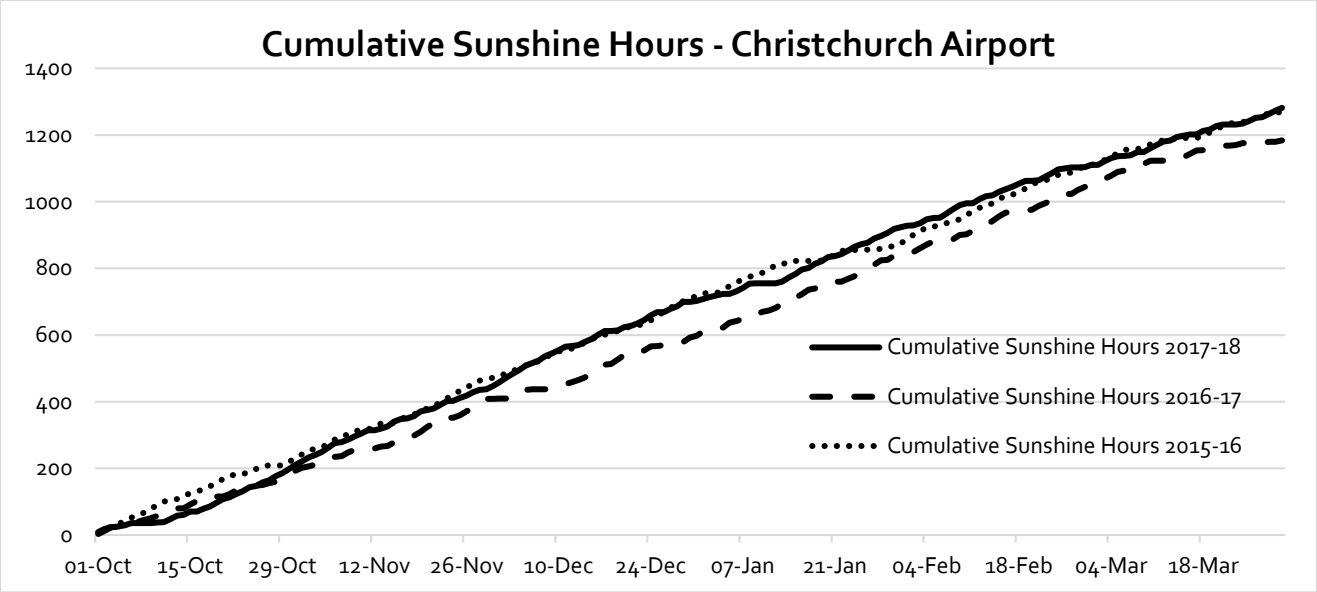
Graph 3 - Weekly Evapotranspiration (mm)



Graph 4 - Soil Moisture levels across the season.

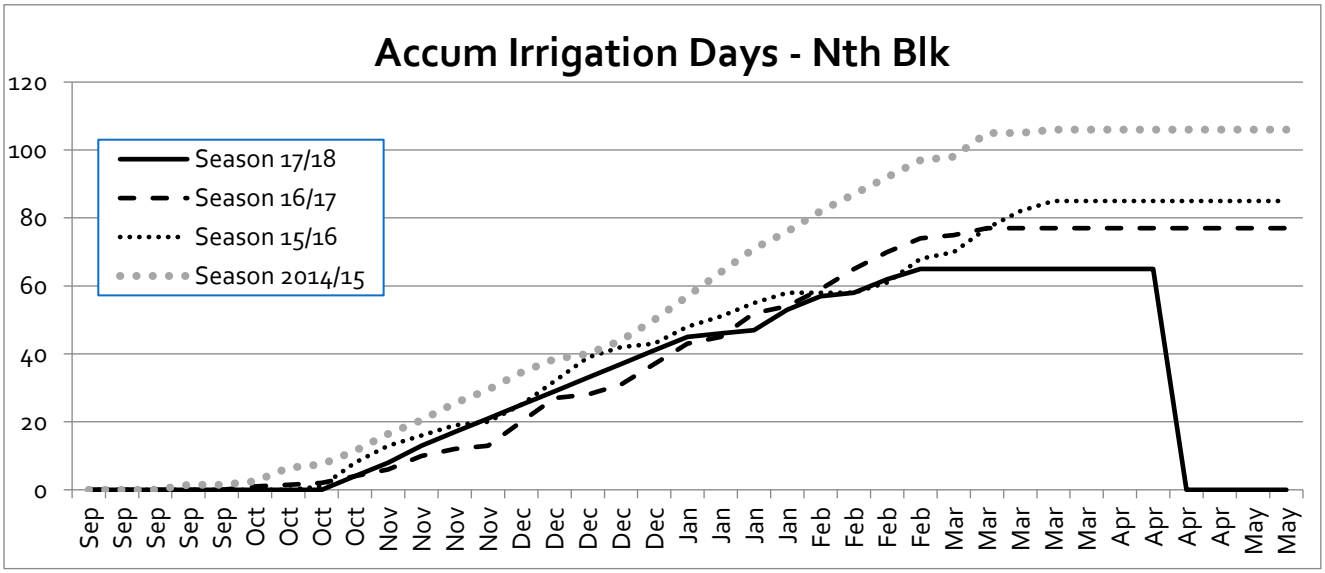


Graph 5 - Cumulative Sunshine Hours (NIWA)



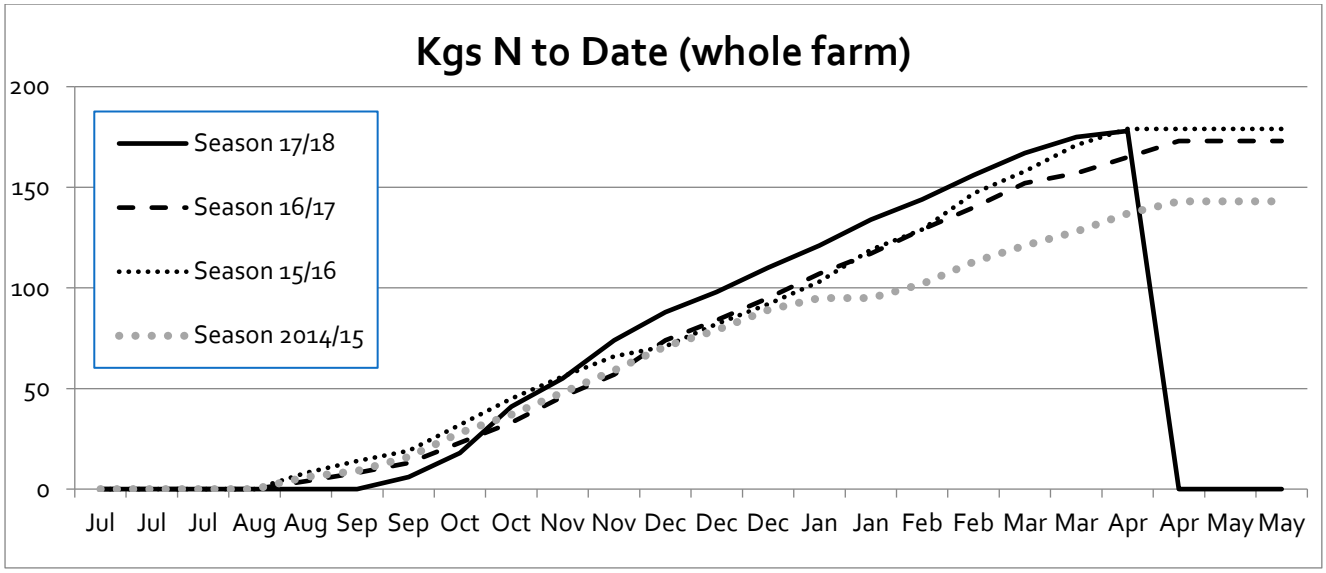
The data for sunshine hours (above) is a measure of the amount of direct sunshine a site receives. It can also be thought of as a proxy for the general level of cloudiness at a given location. Surrounding terrain or buildings that cast shadows on the instrument will also affect the amount of direct sunshine recorded

Graph 6 - Accumulated irrigation day's north block

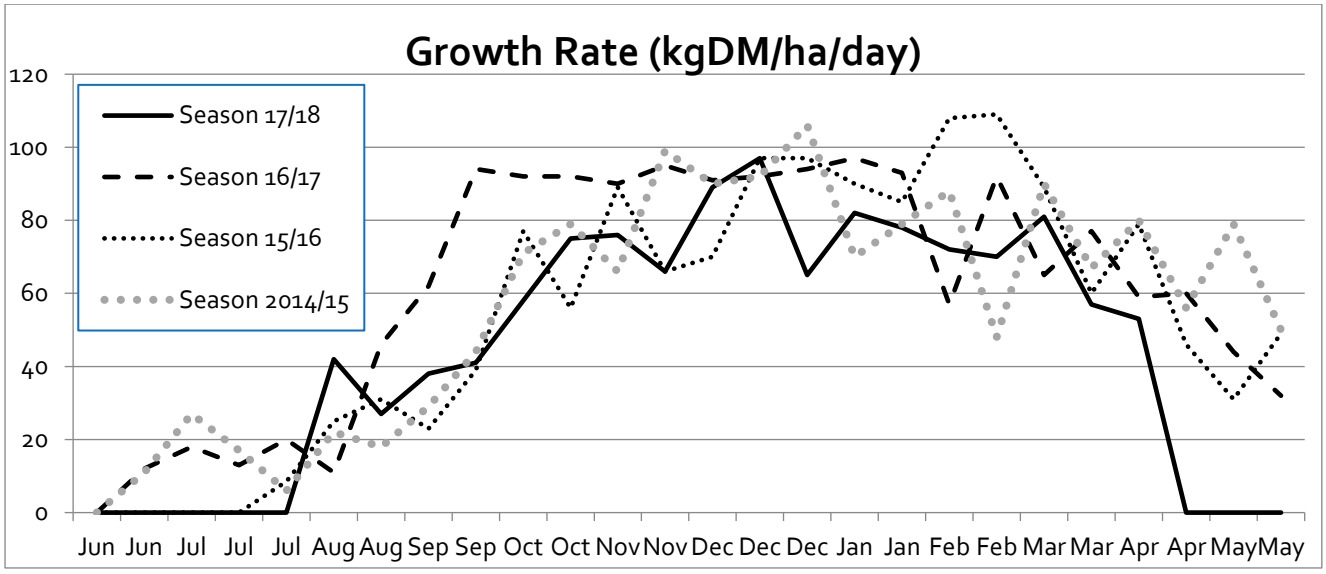


Irrigation on the north block was a challenge through the first half of the season with ongoing technical malfunctions causing the pivot to stop (going out on "safety"). The intermittent large rainfall events since late December have meant that soil moisture was then maintained within optimal conditions and subsequent irrigation was not required as much as in previous seasons. The graphs above clearly show how the high temperatures, intense sunshine and inoperability of the north pivot resulted in topsoil moisture levels dropping below the target range of 60-80% soil moisture during November and December.

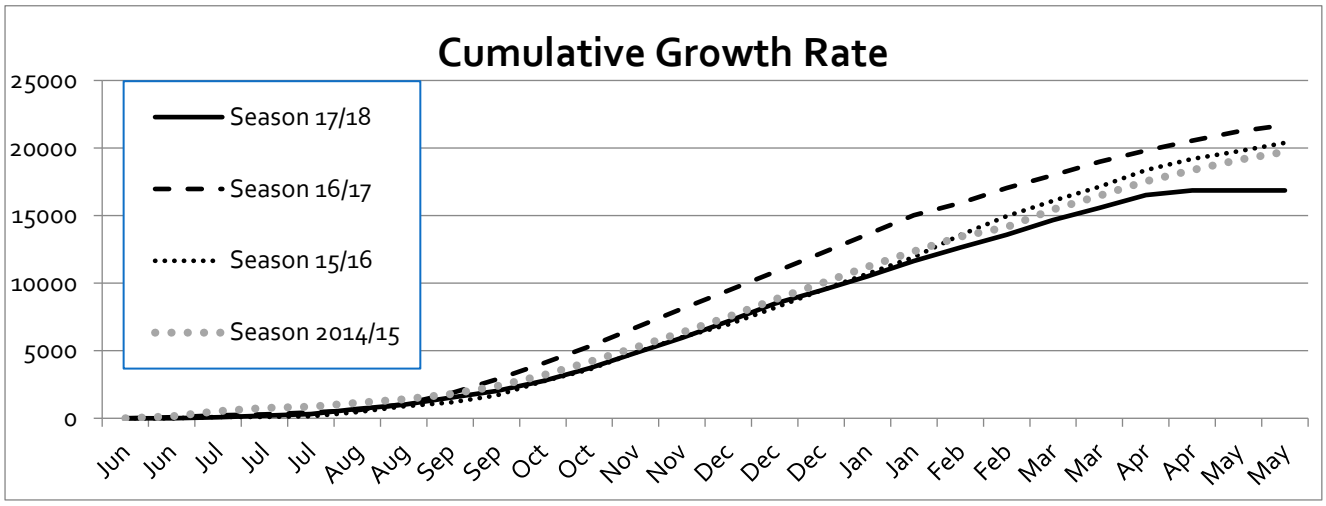
Graph 7 - Farm average Nitrogen fertiliser application



Graph 8 - Growth rate kgDM/ha/day (from the weekly farm walk and Rising Plate Meter Measurements)



Graph 9 - Cumulative growth rate



Cumulative growth rates are based on the weekly growth rate data above, but as noted in the farm walk notes during the season, weekly growth rates measured with the Rising Plate Meter often over estimated that which was apparent when calculating growth rate based on intake and change in average pasture cover. Therefore the data above needs to be considered in relation to this statement and in a relative sense, rather than absolute terms.

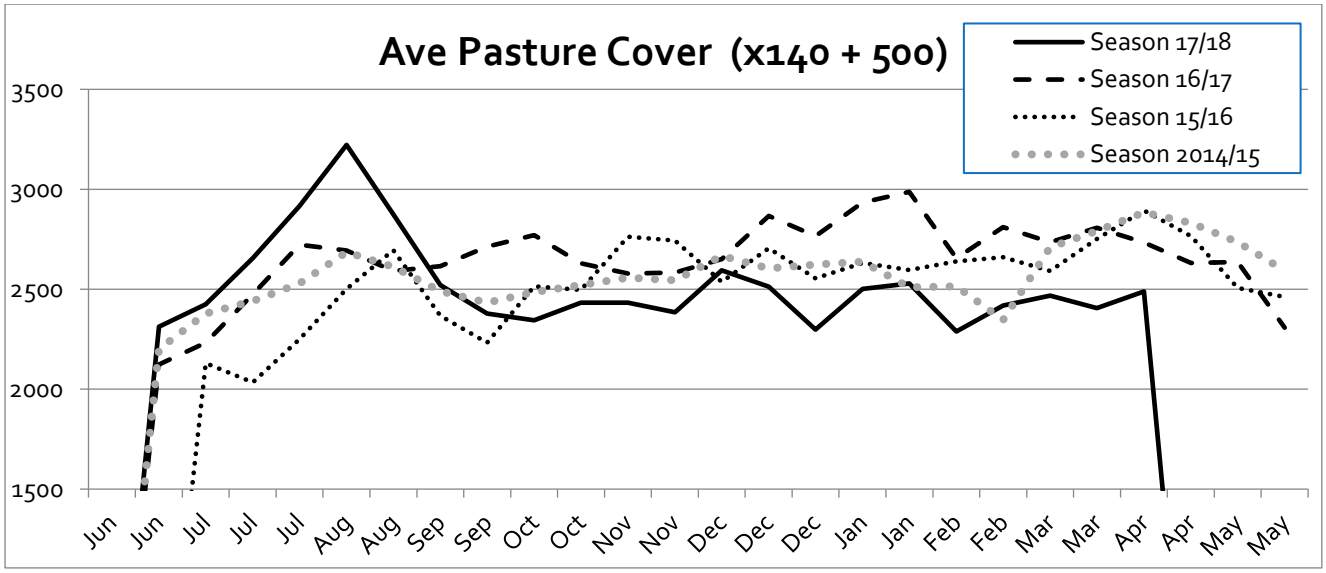
In terms of pasture management, utilisation was the challenge during the wet start of the season. It was not possible to entirely follow the Spring Rotation Planner and residuals were not always achieved, particularly as pregraze covers were approximately 4000kgDM/ha for much of the first grazing round. Adding to this mix, a few of the paddocks were damaged with pugging, which were later heavy rolled and stitched with new pastures (about 10 hectares were over-drilled across the farm).

Maintaining high quality pasture to the base of the sward was a consistent challenge after the first grazing, with some paddocks unable to be tidied up for the next couple of grazings due to intermittent rainfall events. These paddocks were managed with the harvesting of some silage (with early surpluses) and by mowing post-grazing rather than pre-grazing when conditions allowed this.

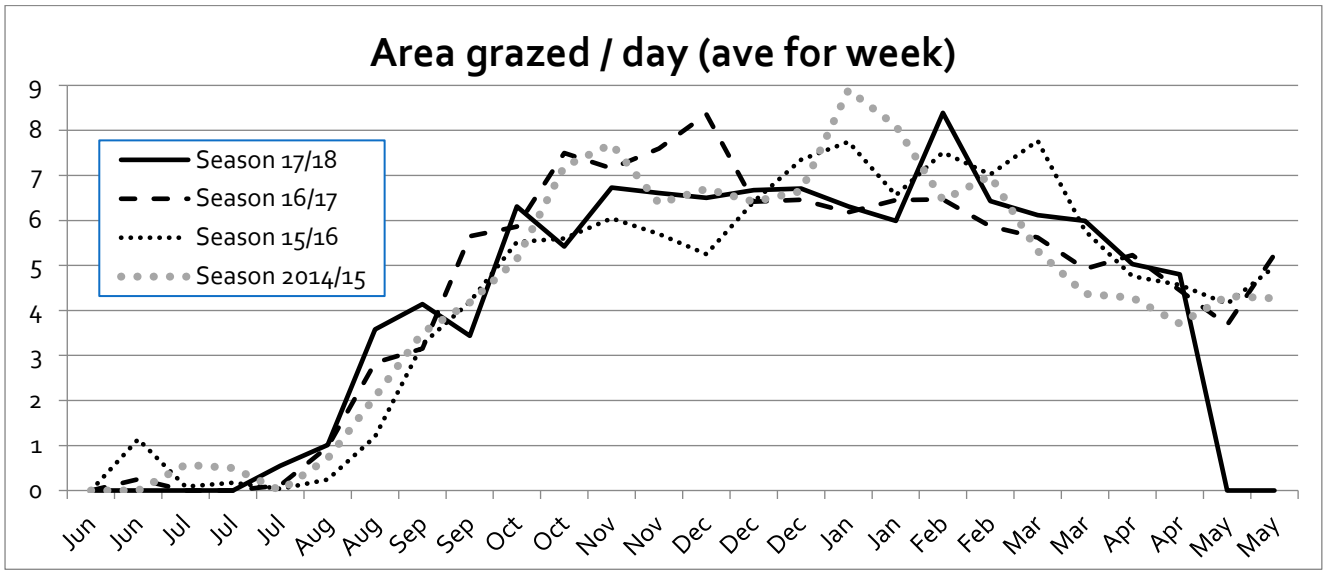
Following the wet start to the season, the dry hot conditions during November-December meant that seed head was fast to appear, and hard to control with 24 day grazing rounds. Seed head appearance continued through multiple grazings, well into January.

The autumn was better in term of growing conditions with good amount of sunshine and enough rain and irrigation. The large southerly storm in mid-April resulted in a significant drop in temperature from then onwards.

Graph 10 - Average pasture cover

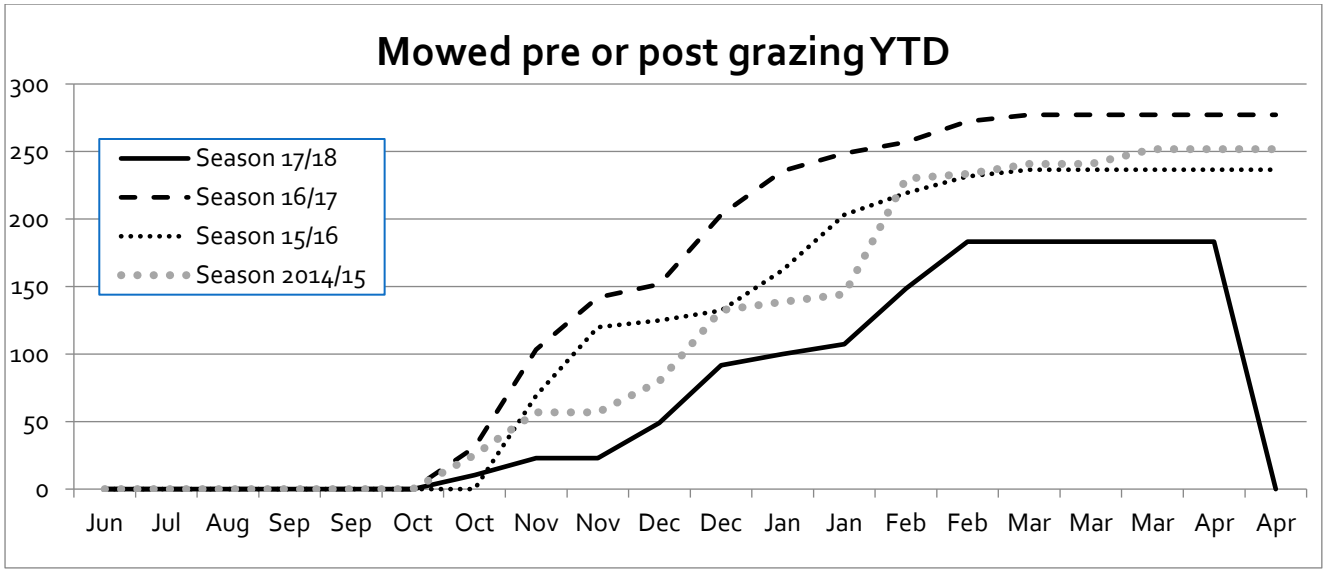


Graph 11 - Area grazed/day (average for week)

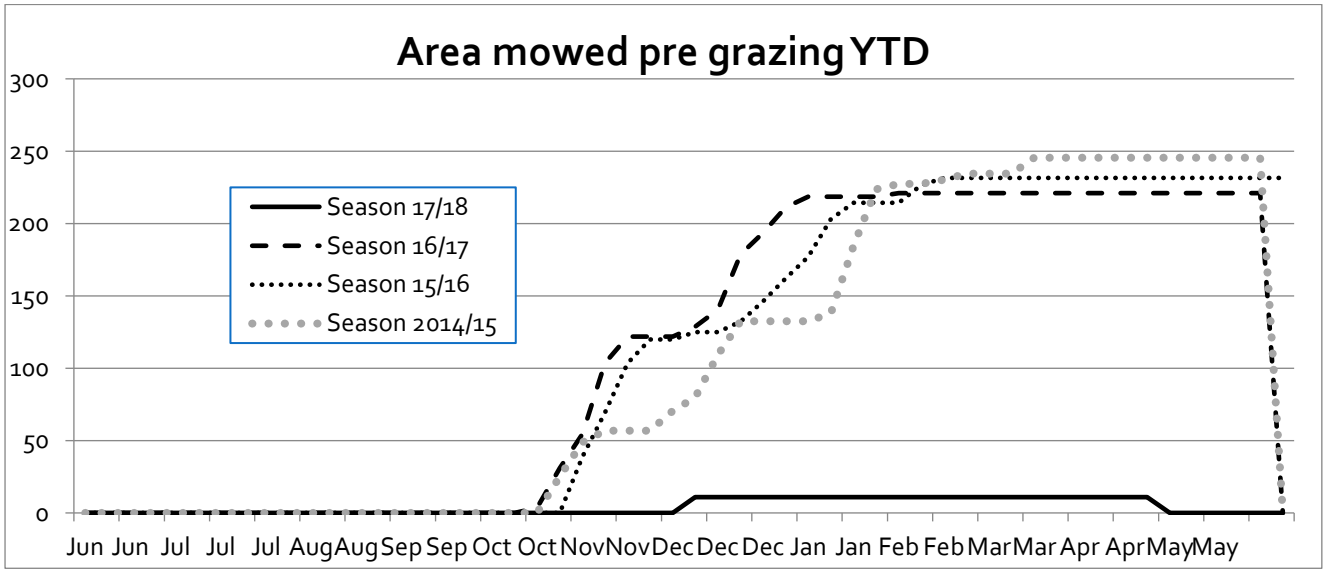


In terms of mechanical intervention to assist with maintaining good pasture quality, the graphs below show the difference between pre and post grazing mowing management this season, compared to both previous season's. Post-graze mowing was the tool of choice for most of the season, particularly if prior grazings had not achieved high quality residuals. With the frequent re-appearance of seedheads, eliminating cow choice at grazing would have been detrimental for milk production.

Graph 12 - Cumulative Area mowed pre or post grazing.

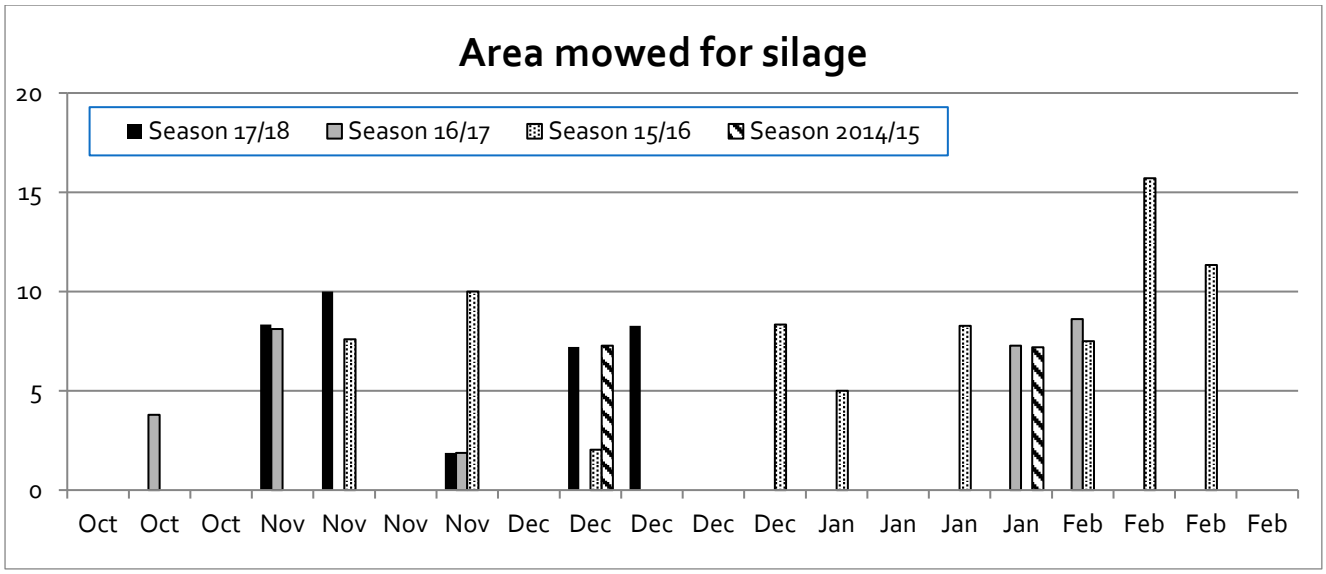


Graph 13 - Area mowed pre grazing

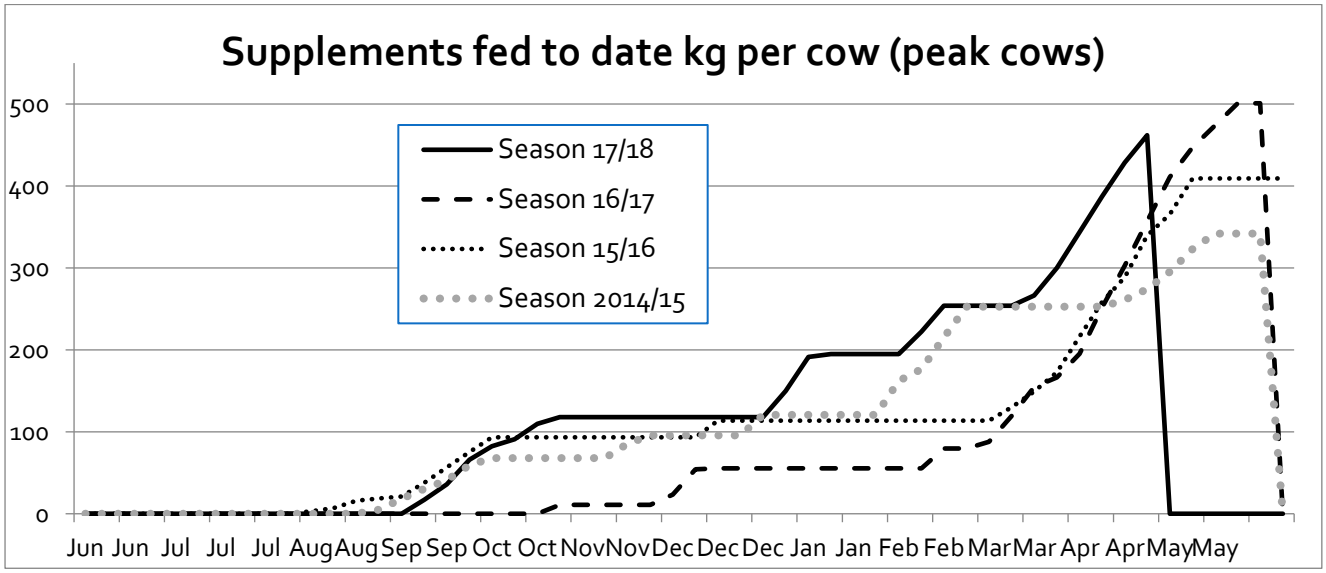


The above rendered it difficult to harvest much silage off the platform, as shown on the graph below:

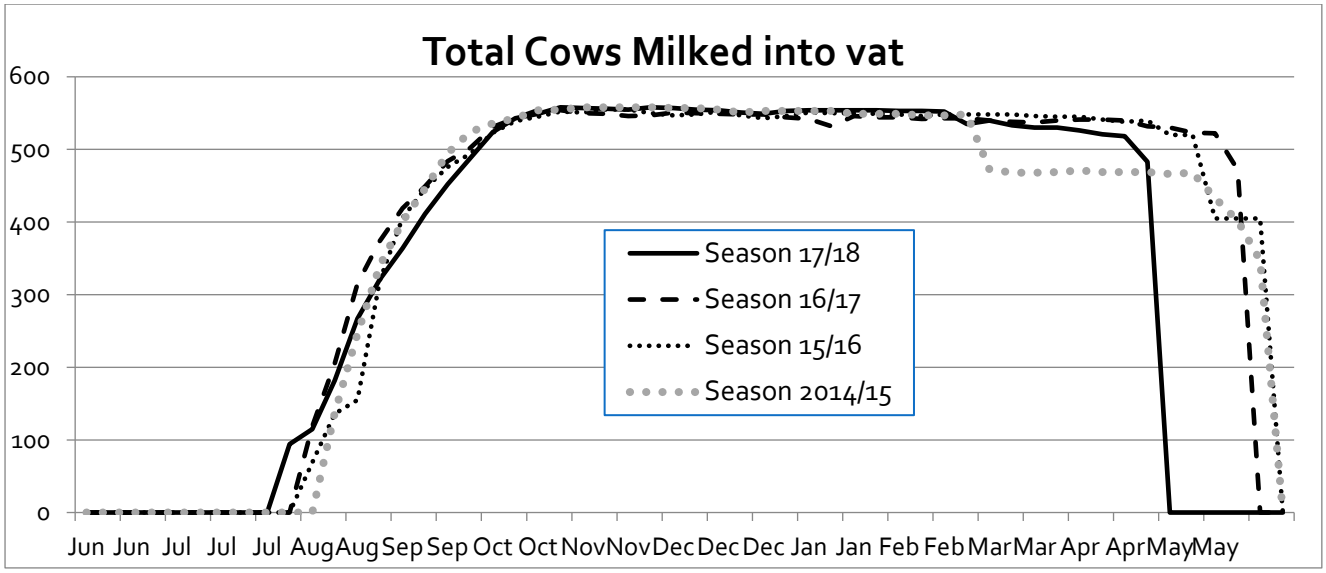
Graph 14 - Area mowed for silage



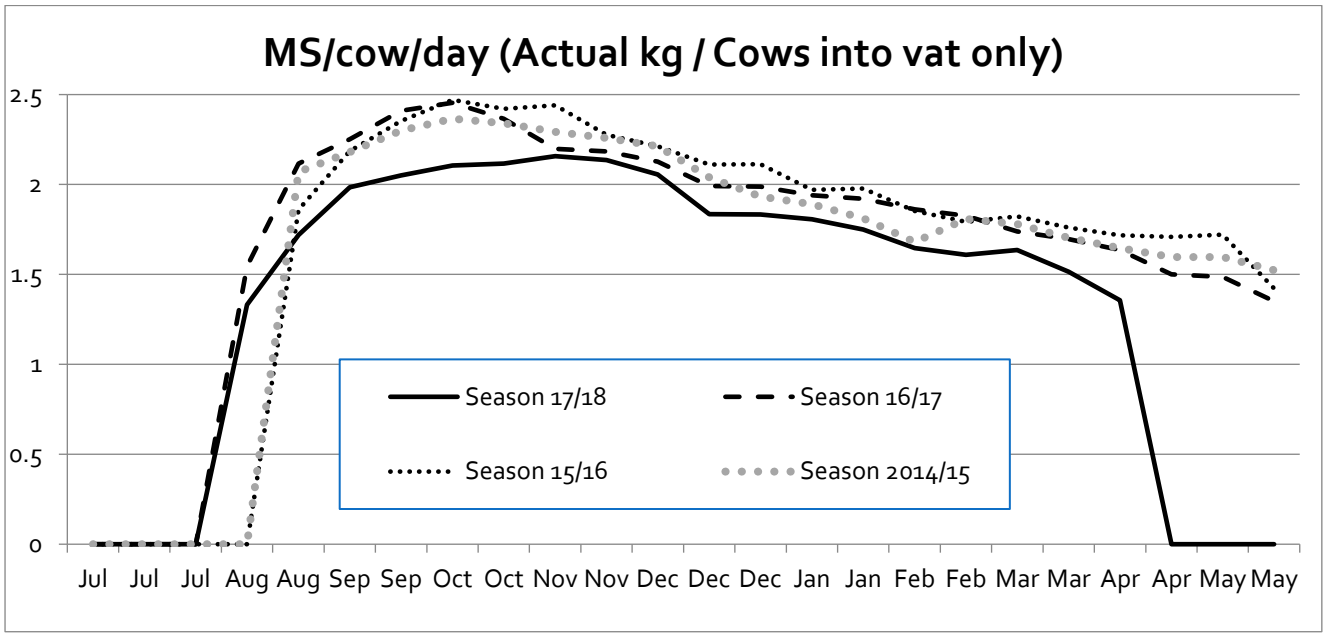
Graph 15 - Supplements fed to date - kgDM per cow (peak cows)



Graph 16 - Total cows in milk



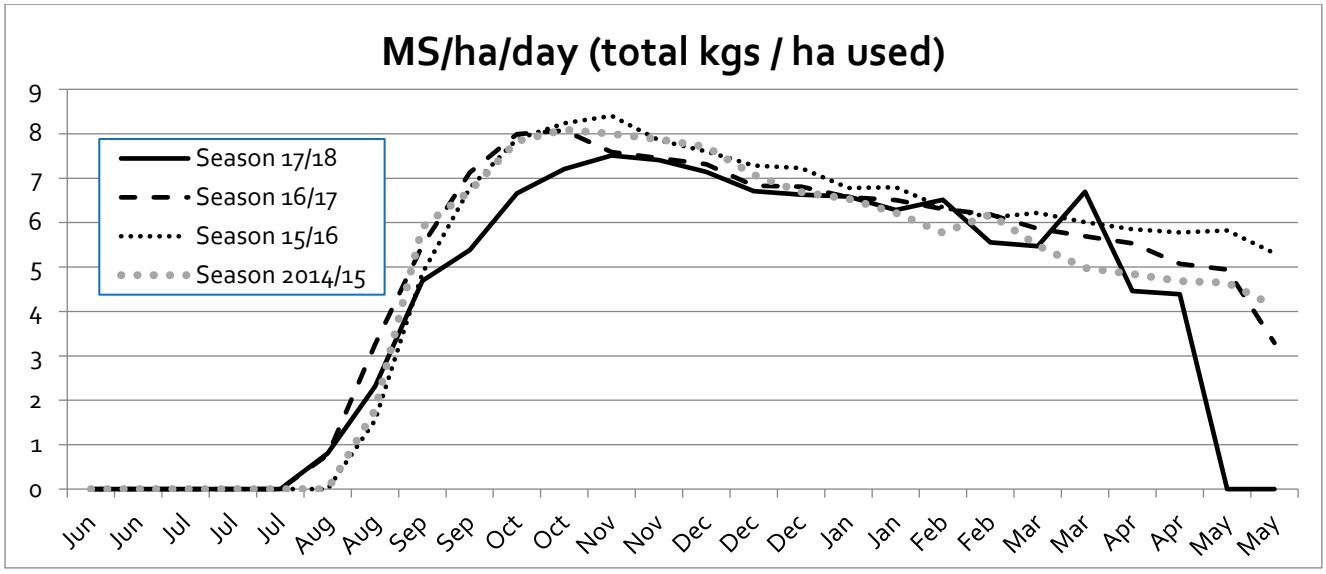
Graph 17 - Average Milk Production per cow per day



The temperatures experienced also resulted in cows changing their grazing behaviour during the heat of the day and during the thick of the storms. During the heat, cows were more often choosing not to graze, standing by the troughs and in some cases bothered by flies as well as the heat. During the storms, the cows huddled up at the corner of paddocks, not grazing well - sometimes for 1 or 2 days - depending on the length of the storm.

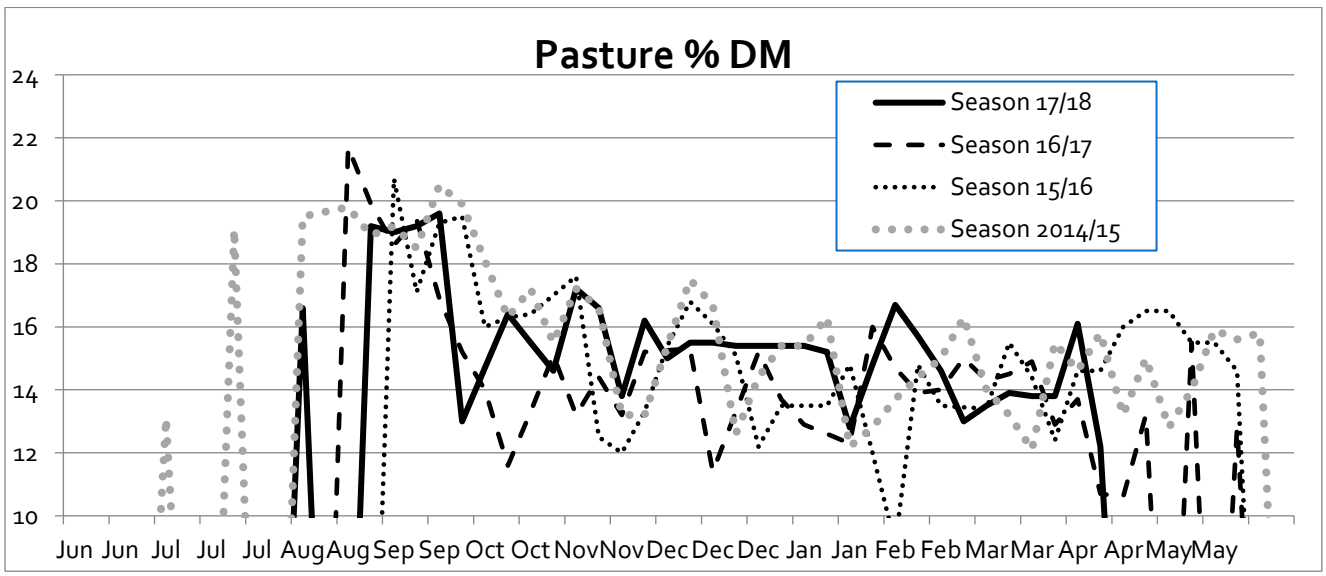
Together with the challenging start to the season and the slower calving spread (as above), it has therefore been difficult to maintain target milk production this season. Clearly cows did not peak as they have in past seasons (see October focus day notes). Production dropped significantly at 2 points in November and December - coinciding with the hot weather and then again from early March until now.

Graph 18 - Average milk production per hectare per day

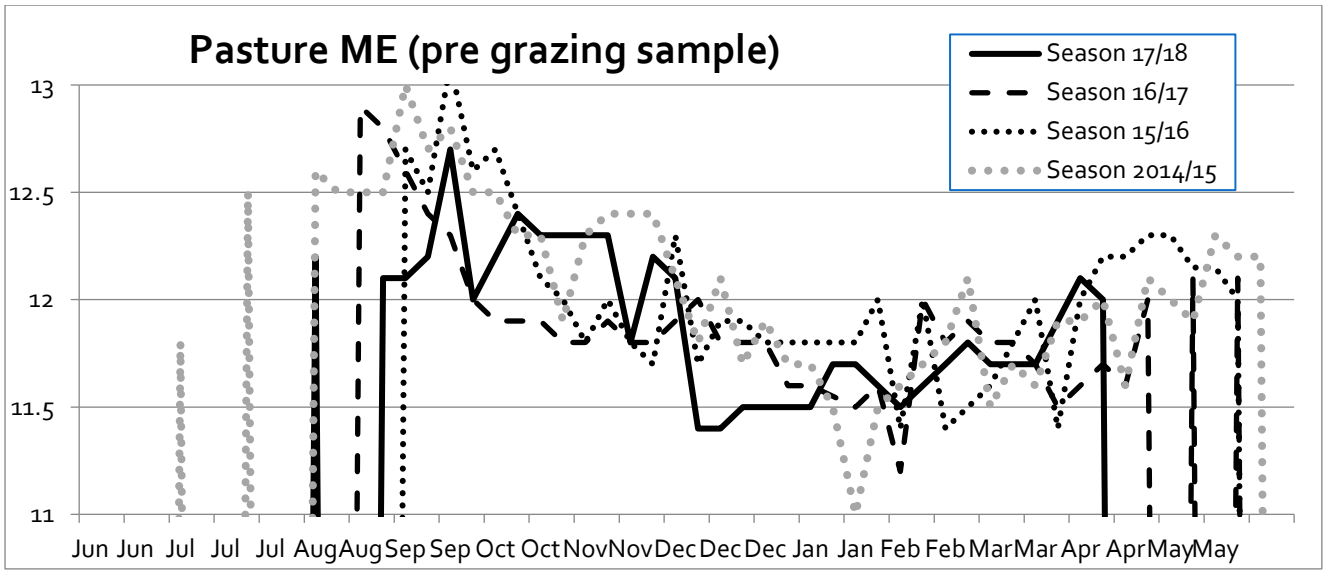


Pasture in the November - December period can be described as low ME, low protein, high DM% and increasing NDF %, with levels improving by February. This coincided with a small loss in BCS in the herd and a drop in milk production, suggesting cows were producing milk while utilizing their reserves rather than obtaining full nutrient requirements from pastures. Average pasture cover over this time appeared high for most of this time - ie no deficit was identified through this period, which means that cows were eating their fill but the quality of the pasture consumed did not match the actual demand for energy and protein.

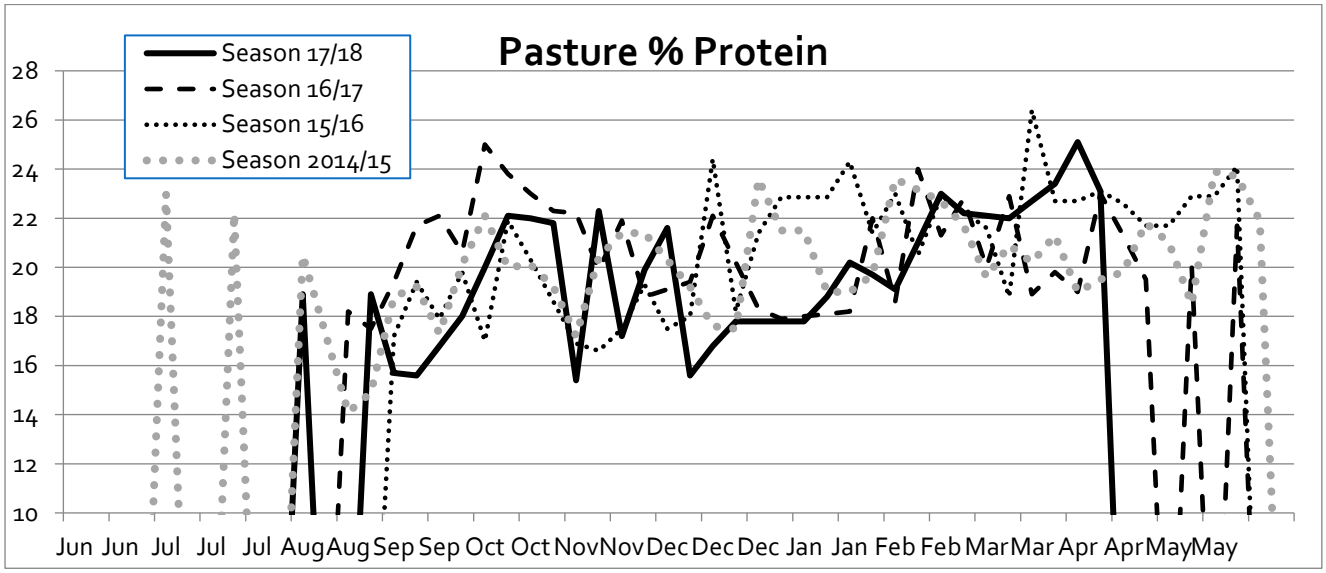
Graph 19 - Pasture DryMatter Percentage



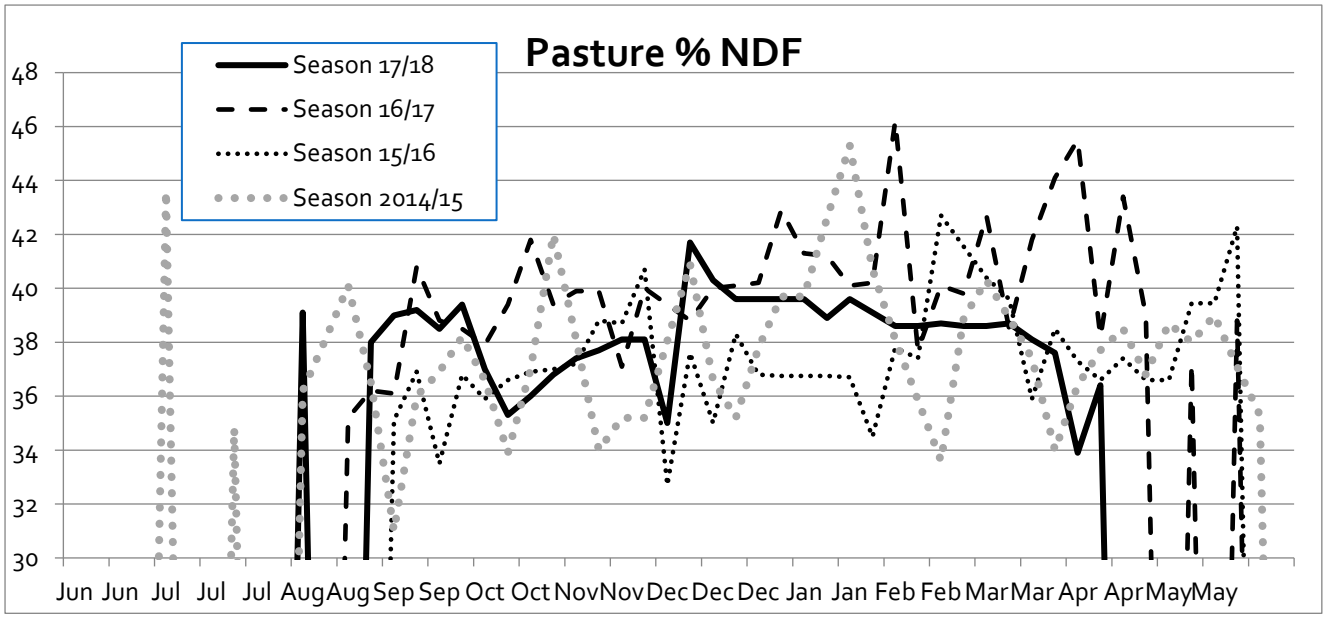
Graph 20 - Pasture Energy Concentration



Graph 21 - Pasture Protein Concentration

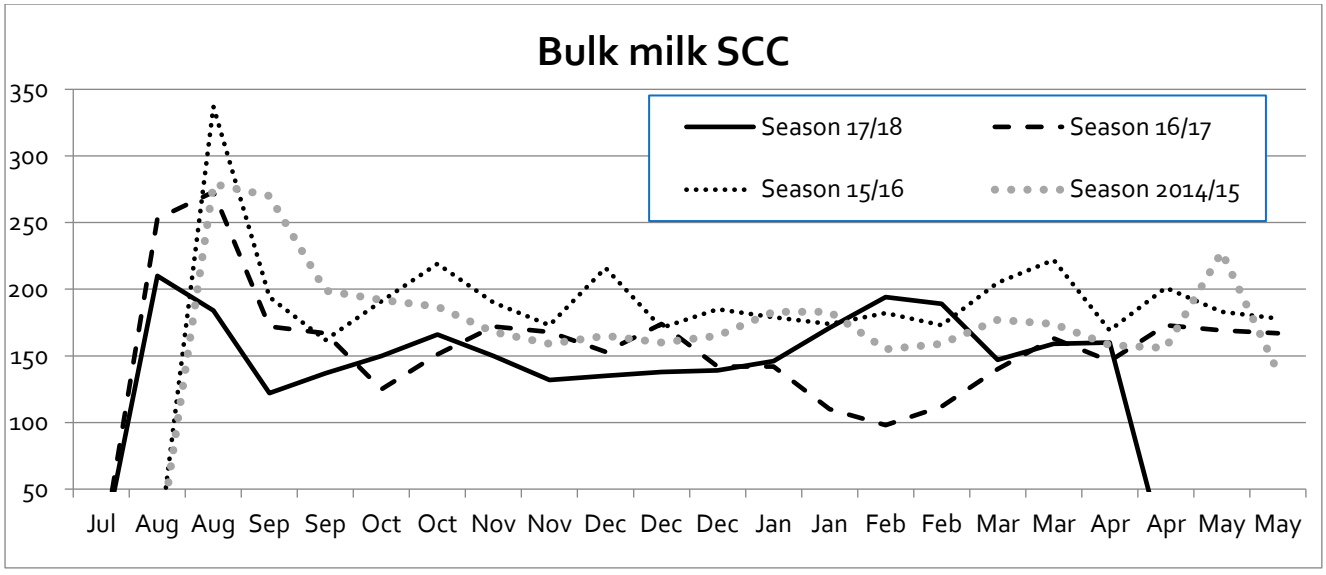


Graph 22 - Pasture NDF percentage



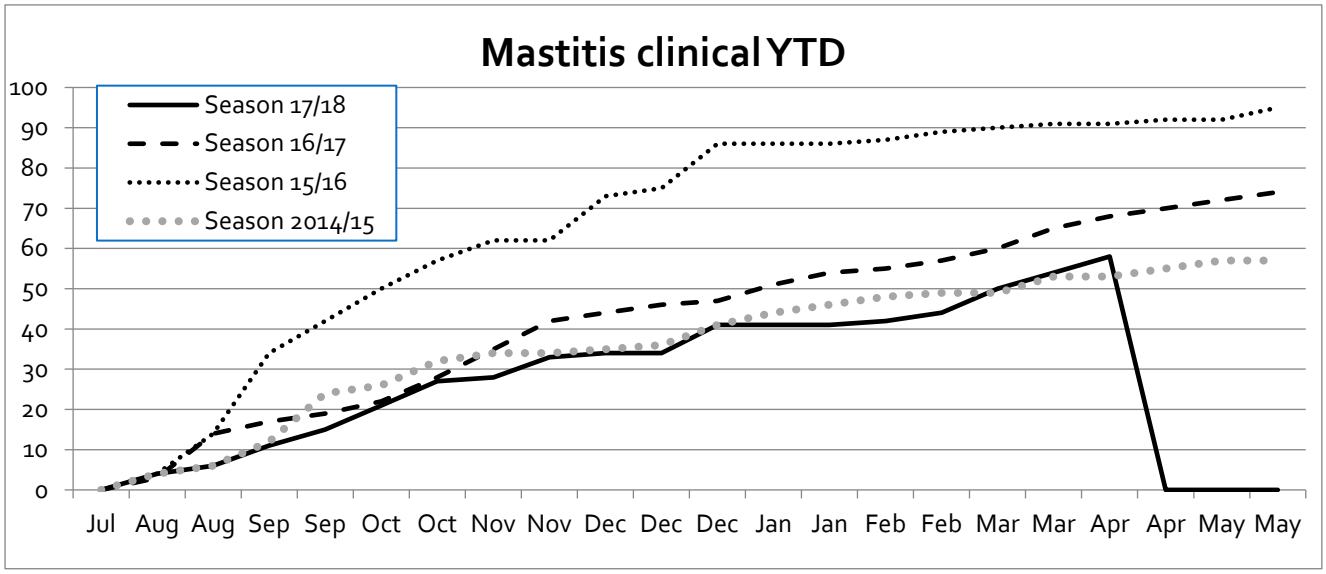
ANIMAL HEALTH

Graph 23 - Bulk Milk SCC

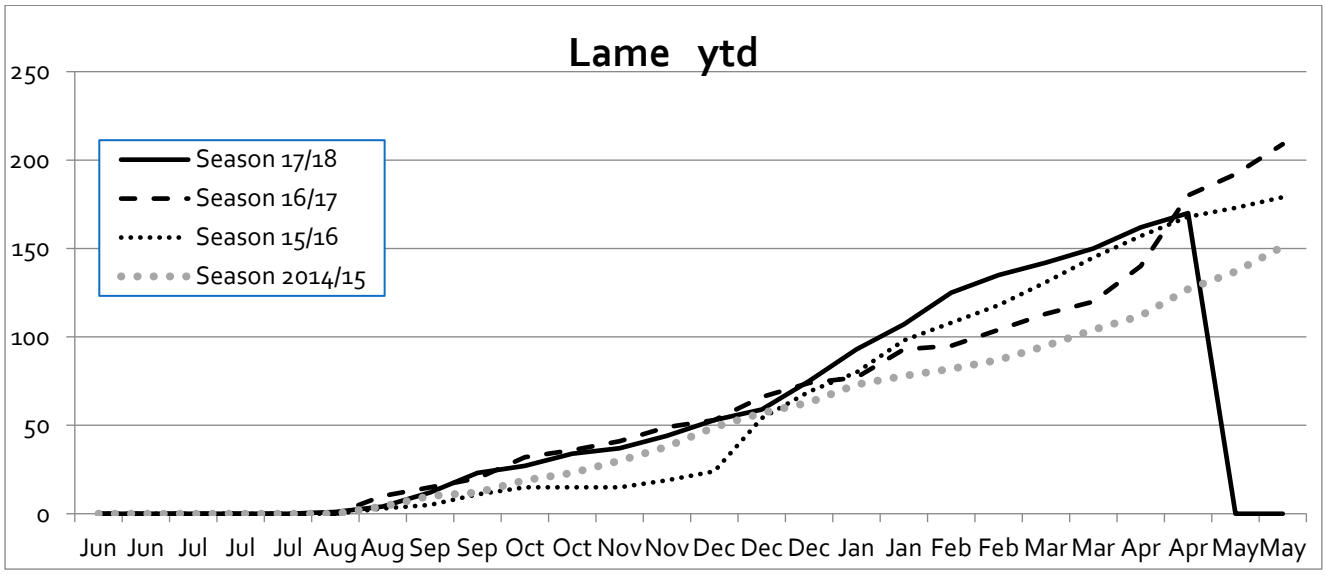


BMSCC were on average the lowest they have been in the past 3 season, except during the February period. Consistent and pro-active observation and identification of animals remains a focus for this farm. The graphs below, show the season-to-date number of mastitis cases treated this season, was the lowest / lowest equal over the past 4 years.

Graph 24 - Number Clinical Mastitis cows

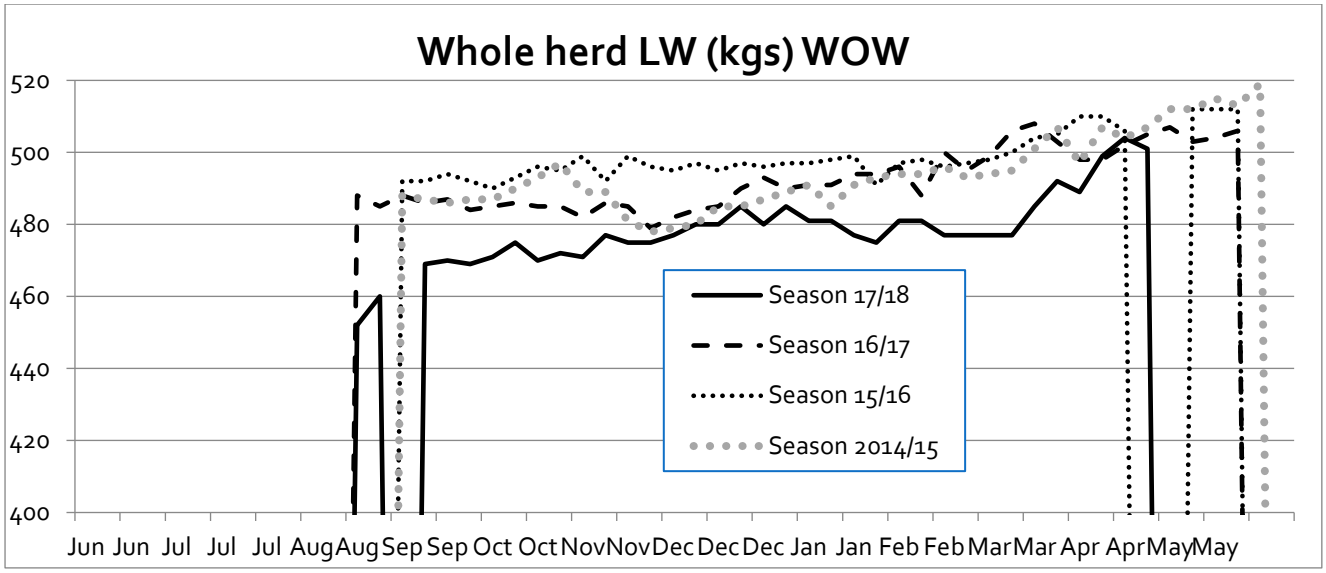


Graph 25 - Total Lame cow days (YTD)

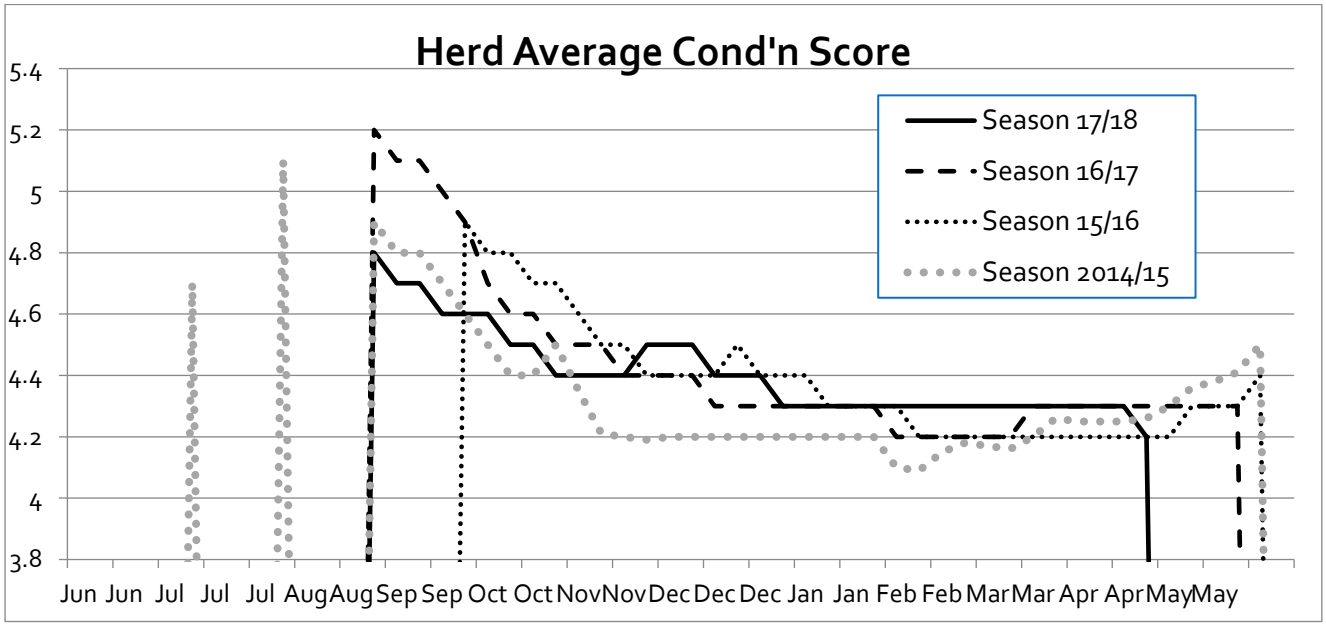


Lameness remains a key challenge for LUDF. With the intermittent wet weather, lameness has remained a steady problem for the LUDF herd through the season, even with the proactive hoof trimming going on through the year.

Graph 26 - Whole Herd Weekly average live-weight (kg LWT/cow)

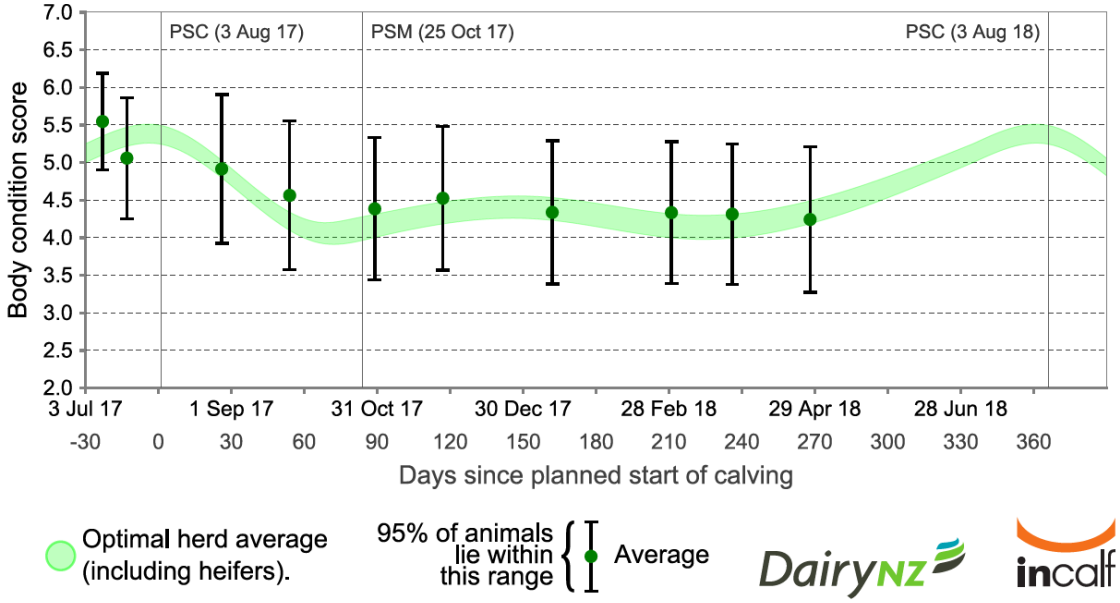


Graph 27 - Herd Average Cow Condition Score across years



AUTUMN PLANS AND FARM MANAGEMENT:

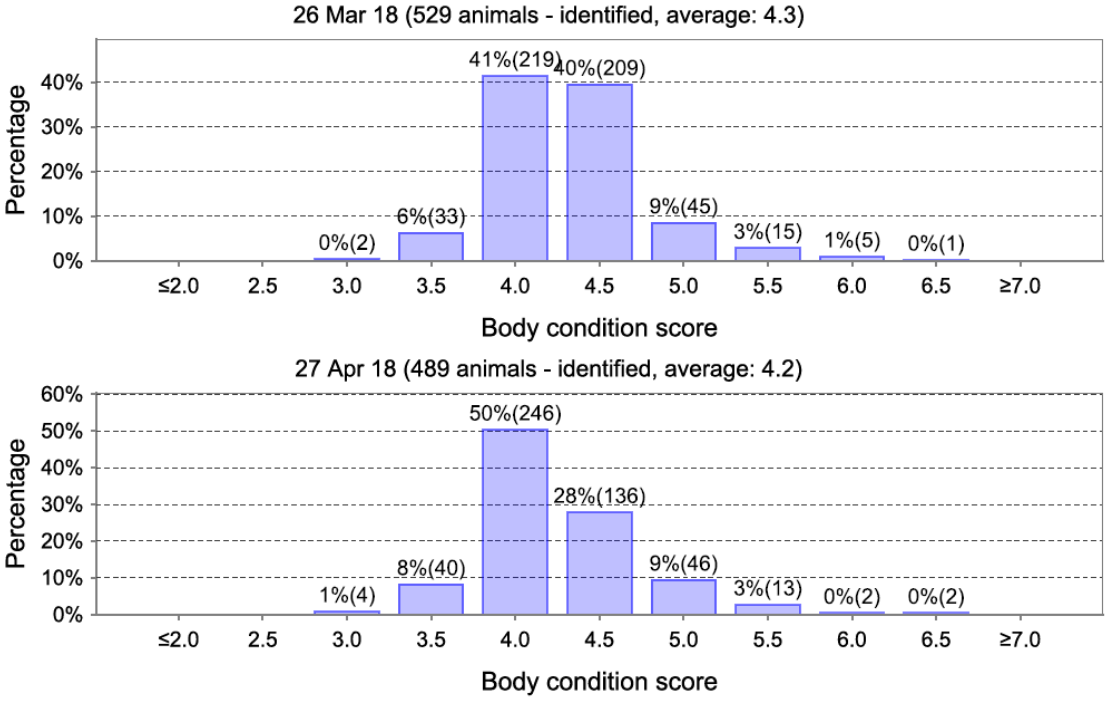
COW CONDITION SCORE ACROSS THE SEASON:



At 27th April, the whole herd average cow condition score was recorded as 4.2, back from 4.3, one month earlier. The result is somewhat surprising given the increase of approximately 10kg /cow liveweight over the past month.

44 cows are below CS 4, compared to 35 last month, while 63 cows are at CS 5.0 or higher, very similar to the 66 recorded at 5.0 or higher on 26th March.

46 fewer cows are in the remaining group with a CS between 4 and 5. These represent the cows that have been dried off on the basis of their CS and calving date.



DRYING OFF RULES:

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 fully feeding cows that have been dried off, i.e. - above maintenance levels.

COW NUMBERS - 2018-19

As at 13 April, LUDF had 536 cows on farm, comprising 524 in milk and 12 dry cows.

Currently Available cows	536	
Less empty cows	93	
Less Johnes cows	6	(7 tested positive, one was empty - see below)
Plus InCalf R2 heifers	137	
Total available before Production culling	574	

Based on the above numbers, LUDF will look to cull 14-19 cows, with the plan to winter 555 cows and ideally will have 545 available to milk. This will give the farm a stocking rate of 3.4 cows/ha or 2.4% less than the previous nominal target of 560 cows milked.

If working on the previously published rationale of annual BW improvement equivalent to decreasing the stocking rate by 1 cow per 150 cows per year, then over the past 4 years, LUDF should have either increased feed supply or decreased stocking rate by approximately 15 cows - therefore the stocking rate of 3.4 cows /ha targeted for 2018/19 is comparable to 3.5 cows/ha in 2014/15.

JOHNES DISEASE:

Johne's Disease is a chronic, contagious and sometimes fatal infection caused by Mycobacterium avium subspecies paratuberculosis (MAP). It is an immune reaction that develops in response to the MAP infection.

Johnes disease (JD) risk management primarily revolves around protecting the calf from MAP infection. The interventions in this toolbox have been grouped into five strategies:

1. **Test-and-cull of clinical and high-risk cattle -** *To eliminate a major source of MAP before calving and reduce losses from clinical JD*

   Cows with clinical JD disease are an obvious source of MAP and need to be removed from the herd ASAP. However, faecal shedding may start several years before JD signs appear. Cows in advanced subclinical stages are a major source of MAP. Some cows become super-shedders with the potential to infect many calves with a large dose of MAP. Fortunately, JD tests are good at identifying cows with advanced infection.

2. **Calving and colostrum management -** *To minimise exposure to MAP before birth and at calving via dams' faeces or colostrum*

   Calves that ingest high doses of MAP are more likely to develop JD earlier. While it is impossible to prevent all contact with faeces and other sources of MAP from the dams, it is important to try to limit exposure.

3. **Pre-weaning calf management -** *To avoid contact with adults and prevent exposure to a MAP contaminated environment*

   Repeated ingestion of MAP can hasten the progression of the disease. For convenience the calf rearing shed is usually situated close to the milking shed. Do not allow contact with cows and protect calves from effluent.

4. **Replacement heifer management after weaning -** *To remove susceptible heifers from any source of MAP until they join the dairy herd*

   Whereas adult cattle are less prone to a new infection than the young, calves remain highly susceptible at least for the first year and can be infected when older. Ideally the replacement calves should be removed from the dairy platform as soon as possible and managed at a rearing unit without adult stock (including other ruminant species).

5. **Biosecurity and purchasing low-risk stock -** To reduce the risk of importing MAP into the herd from high risk sources.

For further information:

See the DairyNZ website - https://www.dairynz.co.nz/animal/cow-health/johnes-disease/ or
Johne's Disease Research Consortium - https://www.jdrc.co.nz/

Incidence of Johnes disease at LUDF - based on milk tests / followup blood tests on positive cows.

Year	Number Cows with positive milk test (Suspect / Positive / High positive)	Number Cows with positive blood test (and therefore number culled)
2014-15	18	15
2015-16	20	15 + 2 during season
2016-17	n/a - error in sampling	7, including 3 empty cows
2017-18	7	7 (includes 1 empty), + 2 during the season

DRY COW TREATMENT - PLAN FOR MAY 2018:

The DCT plan for this season is as follows:
(incorporating suggestions from recent DairyNZ research and Vet advice, with desire to reduce antibiotic use as much as practical):

- Using the SCC data from the last herd test, cows above a threshold of 150,000 (MA cows, - 125,000 for heifers), plus any cow treated during season will receive long acting drycow treatment and teat seal. At the last herd test, 76% were below this threshold. This is likely to result in a financial saving of approx. $5000 compared to using DCT on all cows, plus reduces overall antibiotic use on farm.
- All other cows will be checked with RMT a couple of days before dryoff - any showing signs of mastitis will also receive drycow and teat seal.
- Remaining cows will receive teat seal only.
- Groups will be marked and separated into 2 different groups a few days prior to drying off to ease the load of RMT and to avoid risk of milking treated cows.
- Drying off will occur no later than 24th May, and trucks are booked for 28th May. Cows will continue to be checked routinely at grazing - especially over the first few days.
- LUDF will contract the use of vet techs to assist with this process. All cows will be done on same day, starting with teat seal group. Highest risks is cows receiving teat seal only.

FUTURE USE OF DRY COW PRODUCTS – WHAT'S THE LATEST?

(Reprinted from the LUDF February 2018 Focus Day Notes)

Jane Lacy-Hulbert PhD, BSc (Hons)
Technical Developer (SmartSAMM), Senior Scientist (Animals), ***DairyNZ***

1. There is growing pressure to reduce use of antibiotics in agriculture.

Concerns about antimicrobial resistance in human health are leading to a change in the way that antimicrobials are used for food-producing animals. Dairy industries in The Netherlands and the UK are changing the way that antibiotic dry cow products are used, moving from a whole herd or "blanket" approach back to the a more selective, or targeted, approach.

DairyNZ is looking at ways to support farmers to reduce reliance on antibiotic dry cow products, and at the same time, sustain good animal health and milk quality.

2. Protecting cows at dry off is effective

In winter 2015, a study on two herds in Southland compared the effectiveness of different types of treatments at dry off, compared to no treatment, for preventing and treatment of mastitis during the dry period.

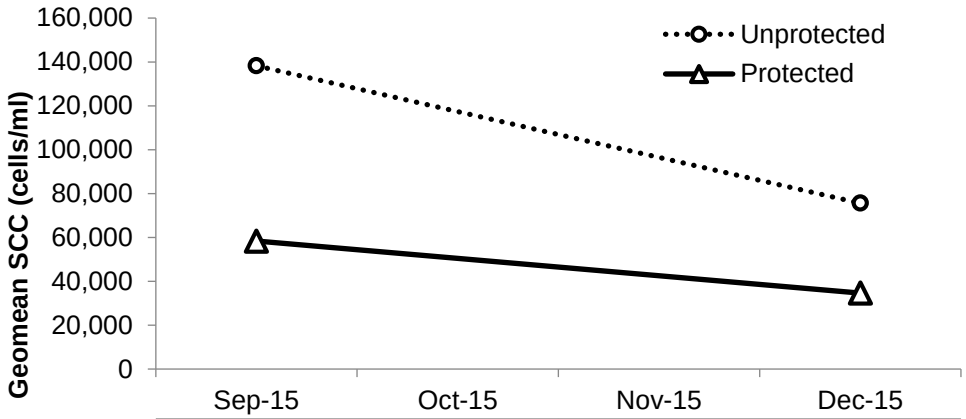
We found that

- As expected, cows that received no protection at dry off had a higher rate of clinical mastitis and subclinical infections at calving, and a higher SCC in the next lactation, compared to cows that received antibiotic dry cow treatment (DCT), internal teat sealant only (ITS) or a combination of the two.
- For low SCC cows, the level of protection afforded by ITS was similar to DCT alone or a combination of DCT and ITS.

Table 1. Outcomes for low SCC cows that received no protection at dry off or received protection.

Outcome:	Unit	Unprotected cows	Protected cows
Clinical mastitis			
Dry period	% cows enrolled	4.4	0 – 1.0
Post calving, first 30d	% cows calved	11.7	3.4 – 4.4
New intramammary infections			
Dry off to 1d post calving			
CNS		19.3	2.8 – 9.9
Strep. uberis	% cows calved	19.8	0.7 – 3.4
All pathogens		50.6	5.1 – 15.1
Dry off to 2-4d post calving			
CNS		26.2	3.2 – 9.8
Strep. uberis	% cows calved	4.2	0.3 – 0.7
All pathogens		46.2	5.2 – 12.3

Figure1. Average SCC at first 2 herd tests for previously low SCC cows that received no protection at dry off or received protection.



	Sep-15	Dec-15
Unprotected	138,229	75,596
Protected	58,357	34,624

3. *Internal teat sealant provides effective protection*

In winter 2017, a DairyNZ study across 36 herds tested the process by which we select cows for treatment at dry off, as well as the efficacy of treating cows with internal teat sealant only. Across 80 cows per herd, and 1800 in total, the prevalence of intramammary infections by different pathogens at dry off was determined. The efficacy of internal teat sealant to prevent clinical mastitis was also tested across 50 low SCC (<200,000 cells/ml) cows per herd, and 1500 cows in total.

We found that:

1. Prevalence of major pathogens infections at dry off was low. About 12% of quarters (30% cows) were infected with any bacteria at dry off and only 2.4% of quarters (7.5% cows) were infected with a major pathogen.
2. In the absence of culture, cow SCC was the best way to identify cows infected with major pathogens. The cut-point, or threshold, was not affected by cow age or herd.
3. The last herd test was as predictive of infection status as multiple herd tests, and a herd test in the last 80 days of lactation was equally predictive.
4. The rate of clinical mastitis in cows treated with internal teat sealant was low, with about 1% of cows treated with teat sealant being reported with clinical mastitis.

Prepare your system – improve prevention during lactation

As we move closer to 2020, prepare your herd for less reliance on antibiotic dry cow therapy. An aspirational goal has been set by NZVA, that by 2020, antibiotics at the end of lactation (dry cow therapy) will only be used in cows that are likely to be infected.

Talk to your vet about the best way to prepare your herd for this change. Make sure that people who administer treatments this autumn are properly trained in aseptic technique. Refer to ***Healthy Udder*** for reminders on this technique.

FEEDING SILAGE VS DRYING OFF

The following notes have been included in the weekly farm walk notes regarding the feeding of silage at present:

The farm continues to hold culls on farm and in milk on the basis of the following calculations:

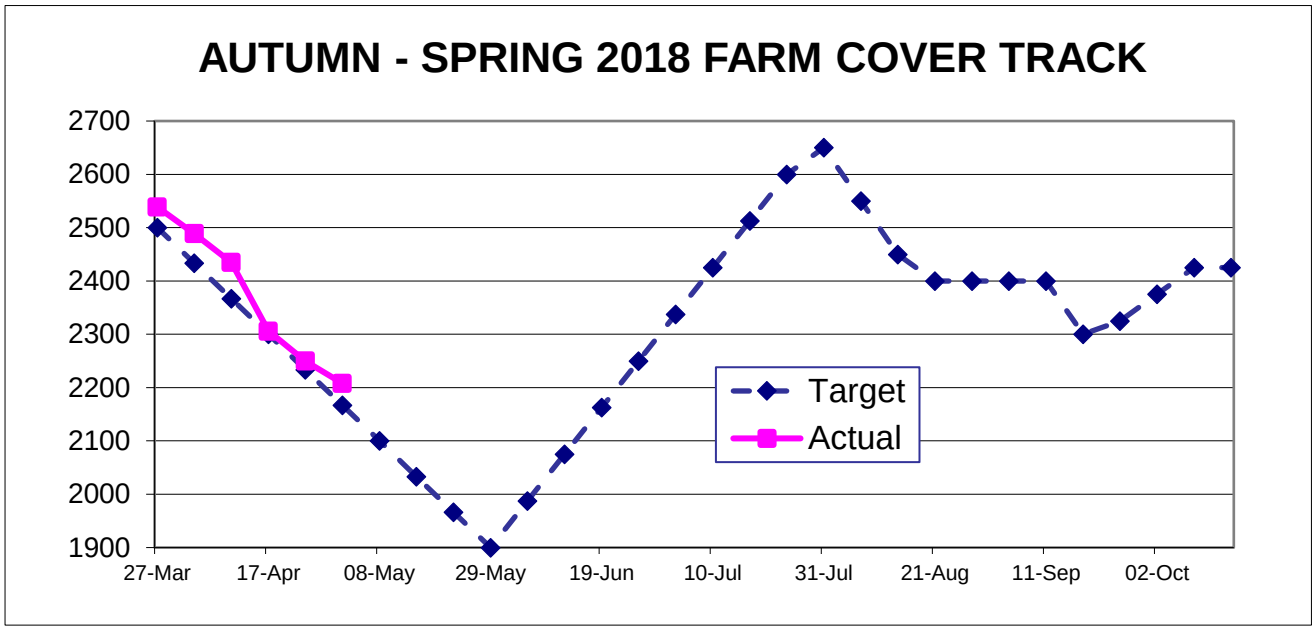
a. Silage cost of 38 cents/kgDM (including feeding out costs) (48 cents if only 80% utilisation).
b. Milk price of $6.55/kgMS
c. Herd average production of 1.36 kgMS/cow (culls were 3% higher on last herd test)
d. Total revenue per day $8.91
e. Total cost silage per day if sole diet fed as silage at 19 kgDM/cow/day = $7.22. This rises to $8.49/day at 85% utilisation.

The above calculation will differ across farms and assumes minimal additional costs for keeping culls in milk (eg staff and shed costs or changes in cull price over the season).

A total diet of silage is used in the above calculation as the removal of culls would reduce feed demand by approximately 12 kgDM/ha/day (100 culls * 19kgDM/cow/day / 160 ha) - and therefore reduce the need for some of the silage.

END OF SEASON TARGET APC

The plan is to finish the season with an Average Pasture Cover of 1900Kg DM/ha which is lower than previous seasons. This is anticipating similar winter growth as in recent years (and acknowledges the amount of the farm in more winter active - hybrid perennial ryegrasses). The target APC at the end of July remains at 2600kgDM/ha and requires an average growth rate over the winter of 11.5kgDM/ha/day.



WINTER FEEDING PLANS:

The herd will be wintered in 4 groups as follows:

a. 134 R2 heifers offered 12 kgDM/cow/day
b. 140 Light CS cows offered 16 kgDM/cow/day
c. 200 Medium CS cows offered 14 kg DM/cow/day
d. 80-100 well conditioned cows offered 10 kgDM/cow/day

The average feed offered is therefore 13.7 kgDM/cow/day. Feed will be a mix of grass and grass silage, with the focus on ensuring light CS cows can increase CS to their target at calving, while also ensuring cows do not go above target CS.

LINCOLN UNIVERSITY DAIRY FARM BUDGET FOR 2018-2019

Year end May 31	160.0ha	**Budget**		**2018/19**	**Forecast 17-18**		**Difference**	
Milk production	Milksolids		1,775/ha	*284,030*	250,000	1,563/ha	34,030	14%
Cows	Peak No & prodn	545 cows	3.41/ha	*521/cow*	*558 cows / 3.49 /ha*			
Staff	3.70 FTE's	147cows or 76,765 kgMS /FTE						
Income				*$/kgMS*	*$/kgMS*		$ change	
Milksolids $6.00/kgms		1,704,178		*6.00*	*6.55*	1,637,500	66,678	4%
Dividend $0.30/share		84,925		*0.30*	*0.30*	75,000	9925	13%
Stock sales	5%	91,650		*0.32*	*0.58*	145,000	-53,350	-37%
DairyNZ levy	-1%	-10,225		*-$0.04*	*-0.036*	-9000	-1,225	14%
Total	**100%**	**1,870,528**		***6.59***	***7.39***	1,848,500	22,028	1%
Stock Purchases		26,400		0.09	*0.13*	33,000	-6,600	-20%
Gross Farm Rev.		**1,844,128**	**11,526/ha**	***6.49***	***7.26***	**1,815,500**	**28,628**	**2%**
Expenses			**$/cow**	***$/kgMS***	***$/kgMS***	$		
Administration		24,700	45.3	**0.09**	**0.09**	23,090	1,610	7%
Animal Health		58,169	106.7	**0.20**	**0.23**	58,200	-31	0%
Breeding Exps		47,114	86.4	**0.17**	**0.19**	50,224	-3110	-6%
Electricity-farm		28,630	52.5	**0.10**	**0.11**	28,630	0	0%
Employment		259,035	475.3	**0.91**	**0.99**	247,929	24,086	10%
Import feed - 400 kgDM/cow		74,240	136.2	**0.26**	**0.31**	92,000	-17,760	-19%
On Farm Sil harv.		8,960	16.4	**0.03**	**0.02**	5,832	3,128	54%
Replmt grazing & meal 25%.		146,242	268.3	**0.51**	**0.57**	143,686	2,556	2%
Wint grazing - Herd incl frgt		188,600	346.1	**0.66**	**0.65**	163,118	25,482	16%
Nitrogen		45,517	83.5	**0.16**	**0.17**	41,404	4113	10%
Fertiliser & Lime		26,240	48.1	**0.09**	**0.12**	30,648	-4408	-14%
Irrigation - All Costs		83,600	153.4	**0.29**	**0.24**	44,520	30,080	88%
Rates & Insurance		21,020	38.6	**0.07**	**0.08**	21,020	0	0%
Regrassing		20,215	37.1	**0.07**	**0.05**	11,720	8,495	72%
Repairs & Maintenance		50,000	91.7	**0.18**	**0.18**	44,000	6,000	14%
Shed Expenses excld power		9,850	18.1	**0.03**	**0.04**	11,022	-1,172	-11%
Vehicle Expenses		28,336	52.0	**0.10**	**0.07**	18,231	10,105	55%
Weed & Pest		500	0.9	**0.00**	**0.00**	500	0	0%
Cash Farm Wkg Exps		**1,120,967**	**-**	**3.95**	**4.14**	**1,035,774**	**85,193**	**8.2%**
Depreciation est		116,000		***0.41***	**0.46**	116,000		
Total Op Exps		1,236,967		***4.36***	**4.61**	1,151,774		
Dairy Op Profit		**607,161**	***1114***	**2.14**	**2.66**	**663,726**	-56,565	
DOP		**3,795/ha**				**4,148/ha**	- 354	
Cash Op Surplus		**723,161**		**2.55**	**3.12**	**779,726**	**-56,565**	
		4,439/ha				**4,873/ha**		

NOTES TO THE 2018-19 BUDGET:

- Milk price of $6.00 and dividend of 30 cents/share presuming one share held for each kgMS produced.
- Fewer Cows wintered - result of 19% empty, some older cows that need to be culled and having only 137 R2's available for 2018-19 (25% at 545 cows peak milked).
- Plan is to winter 555 cows and target 545 peak milk.
- Budget of 400kgDM/cow imported feed (218 t DM at 34 cents/kgDM) lower than forecast for 2017-18.
- Reverting back to purchasing 16 bulls rather than 20.
- Animal health – minor changes
- Breeding – minor changes
- Electricity – same
- Employment, includes rental allowance as a salary cost, netted off as income earned on farm from rental but increases FWE by 27 cents/kgMS.
- Gibberellic Acid - has been removed from the budget as have not been able to use in recent years with longer grazing rotations in early spring.
- Budget of 180kgN/ha.
- Fertiliser is budgeted on basis of soil testing all paddocks and applying maintenance requirements per paddock across the whole farm.
- Irrigation – extra repairs and maintenance budgeted (esp Nth pivot)
- Regrassing budgeting for 2 paddocks plus some stitching
- Overall an increase of approx. $85,000 expenses compared to this years forecast, but only slightly more than this years budget. It is offset by a budgeted increase of 34,000 kgMS thus increasing budgeted income.

Note - if the 2017-18 forecast milk price is applied to the above 2018-19 budget, dairy operating profit rises to over $4700/ha and over $600/ha more than forecast for 2017-18.

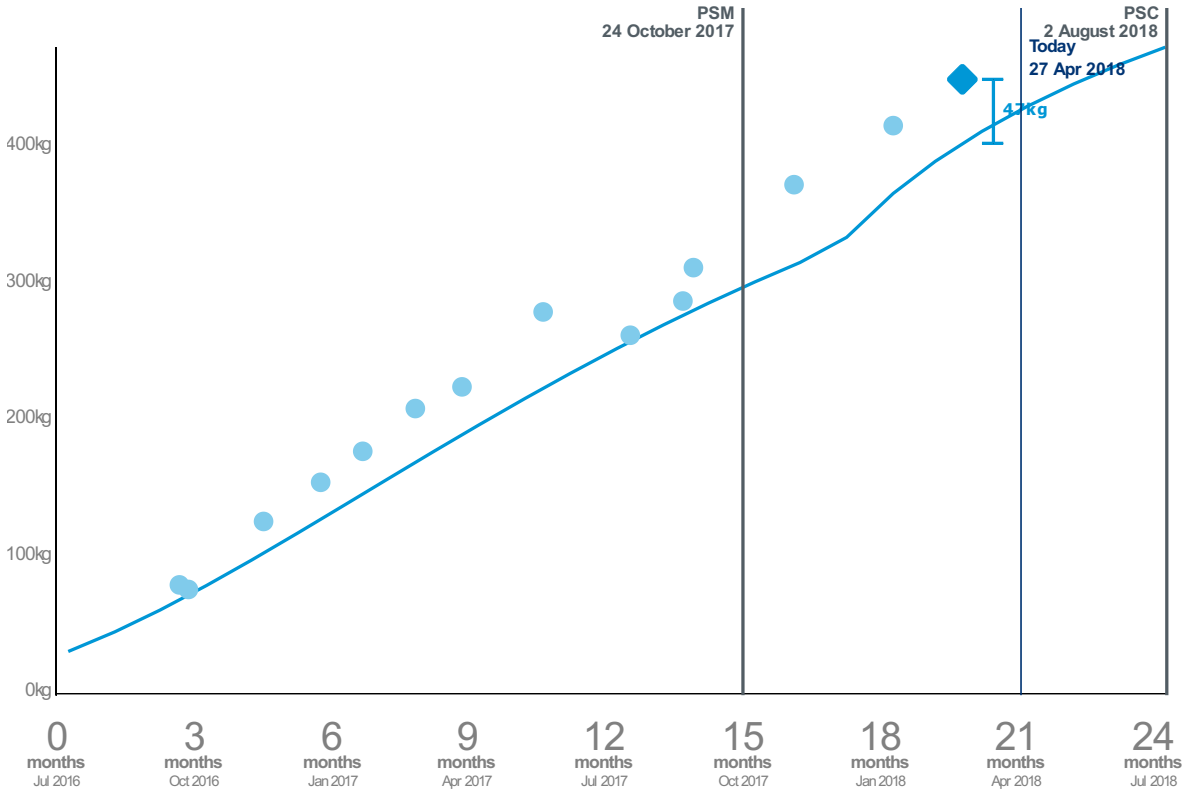
2016 Spring Born

19/03/2018

BQCY

Young stock trend

All 138 animals in this weighing are displayed



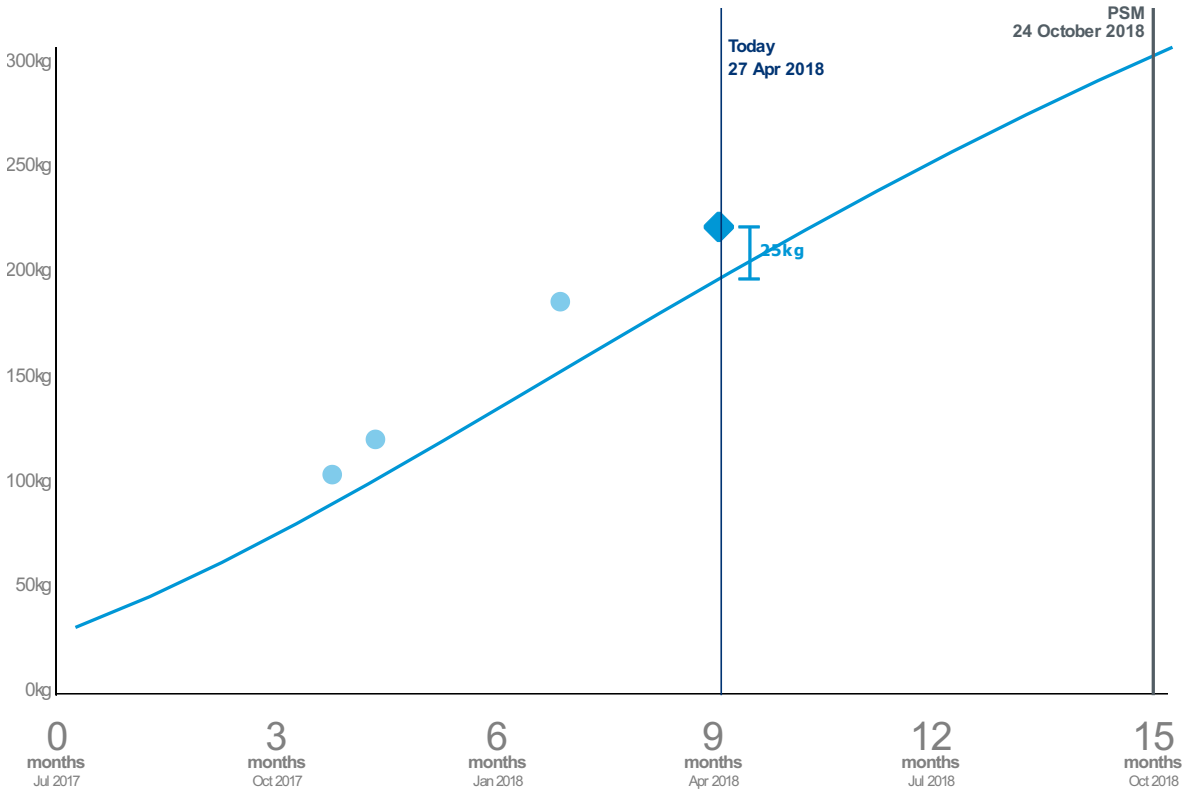
2017 Spring Born

26/04/2018

BQCY

Young stock trend

All 140 animals in this weighing are displayed

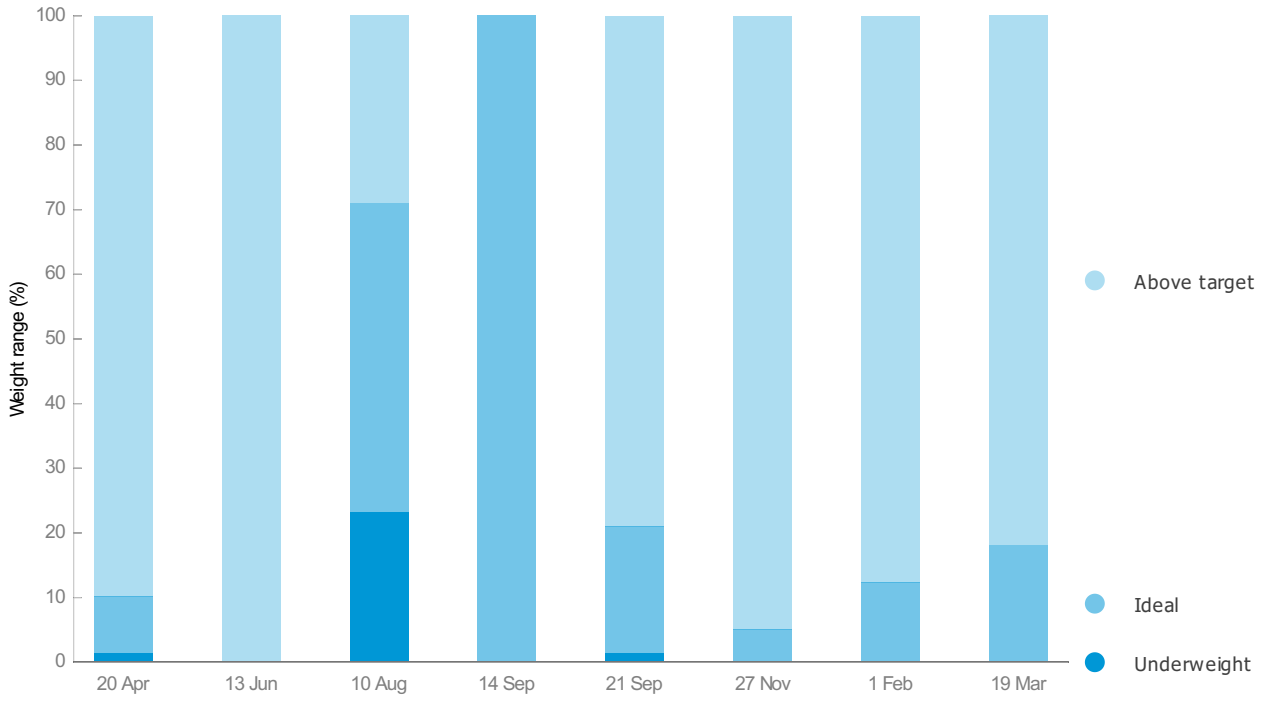


2016 Spring Born

19/03/2018

BQCY

Weight ranges



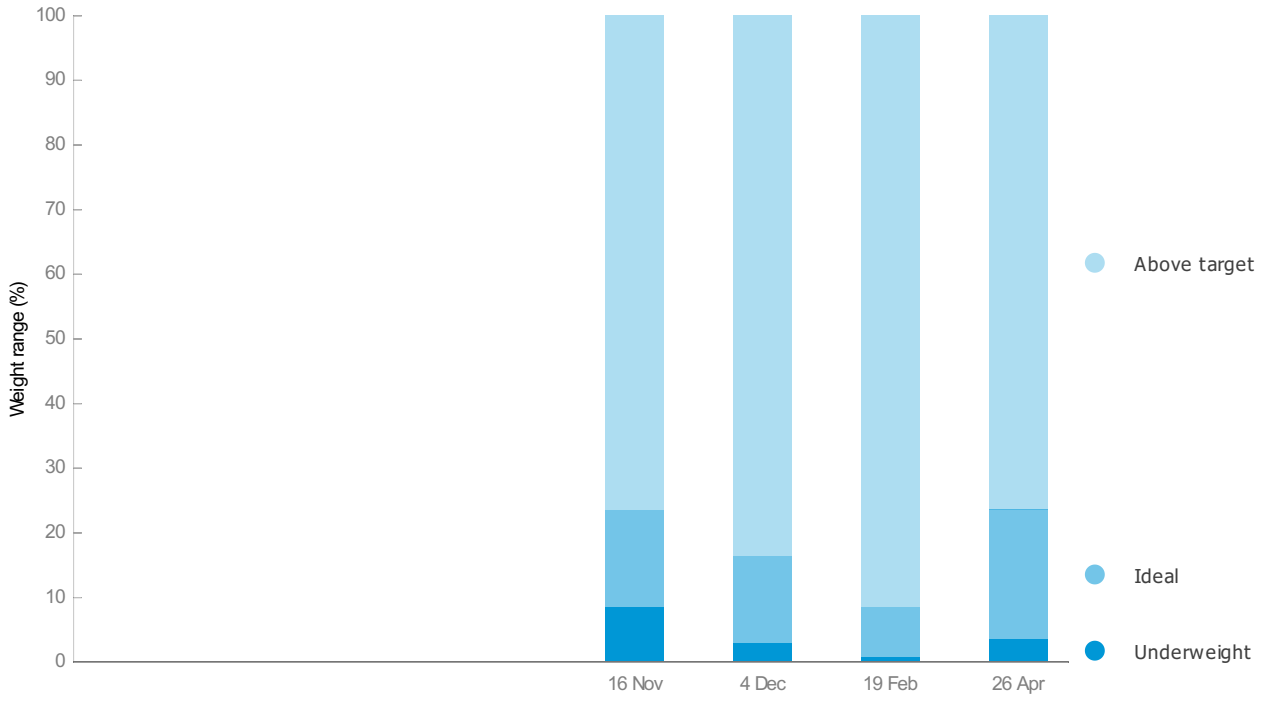
Range	April 2017		June 2017		August 2017		September 2017		September 2017		November 2017		February 2018		March 2018	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Above target	124	89.9	1	100	40	29	0	0	109	79	131	94.9	121	87.7	113	81.9
Ideal	12	8.7	0	0	66	47.8	1	100	27	19.6	7	5.1	17	12.3	25	18.1
Underweight	2	1.4	0	0	32	23.2	0	0	2	1.4	0	0	0	0	0	0
Total Animals	138		1		138		1		138		138		138		138	

2017 Spring Born

26/04/2018

BQCY

Weight ranges



Range	November 2017		December 2017		February 2018		April 2018	
	No.	%	No.	%	No.	%	No.	%
Above target	107	76.4	117	83.6	128	91.4	107	76.4
Ideal	21	15	19	13.6	11	7.9	28	20
Underweight	12	8.6	4	2.9	1	0.7	5	3.6
Total Animals	140		140		140		140	

LUDF FARM WALK NOTES - TUESDAY 1ST MAY 2018

LUDF – focus for 2017/18 Season: Nil-Infrastructure, low input, low N-loss, maximise profit.

Farm system comprises 3.5 cows/ha (peak milked), Target up to 170kgN/ha, 300kgDM/cow imported supplement, plus winter most cows off farm. FWE of less than $1.1 million and Target production of over 500kgMS/cow (>100% liveweight in milk production).

CRITICAL ISSUES FOR THE SHORT TERM

1. **Managing average pasture cover / cow intakes / residuals**
2. **Start setting the farm and herd up for next season with round length and BCS monitoring and management.**

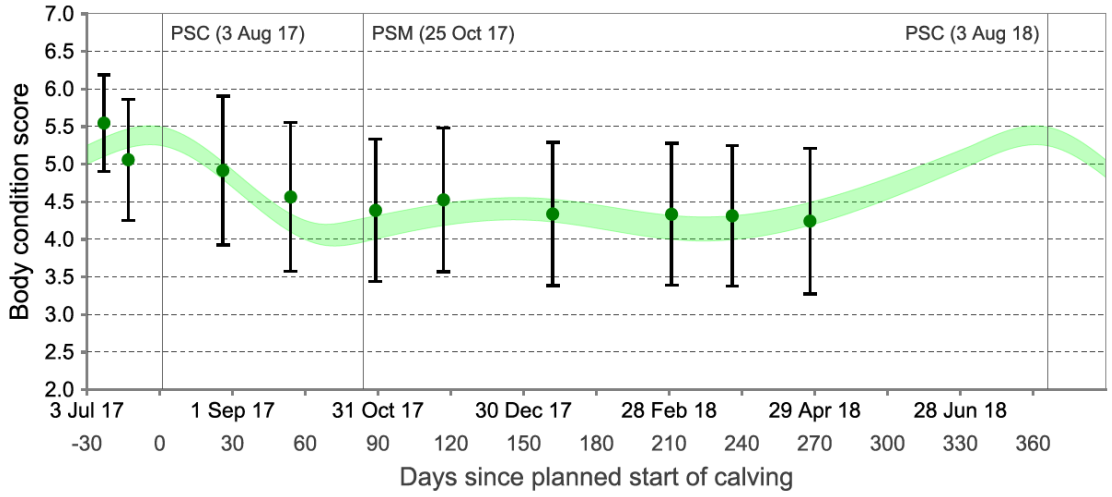
Key Numbers - week ending Tuesday 1st May 2018

Ave Past Cover	2208 kgDM/ha (Rising Plate Meter)	**Pasture Growth Rate**	36 KgDM (Rising Plate Meter).
Round length	37 days (for 160ha)	**Ave Supplement used (Milking cows)**	7.1 kgDM / milking cow / day
No Cows on farm	496 (total cows)	**Ave Soil Temp (week)**	11.3°C
SCC	132,000	**Ave kgMS/cow/day (cows in vat)**	1.38kgMS
Protein / Fat	0.8	**Milk Fat – 5.94%**	**Milk Protein – 4.73%**

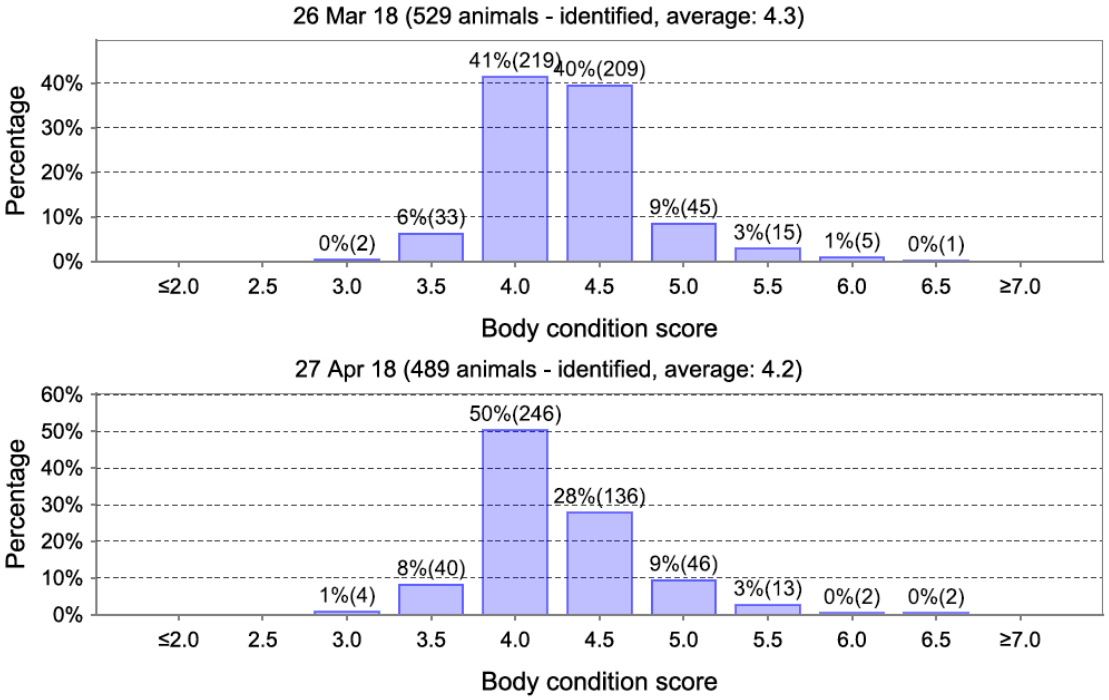
Herd Management

3. The milking herd has a total of 490 cows in milk - 486 twice-a-day milkers, and 13 once-a-day milkers (lames). 1 cow on Depo for lameness. 26 light cows have been dried off. Total demand is based on 496 cows on farm.
4. Bulk milk testing in April showed a low SP ratio indicating there has been no change of LUDFs BVD status ie LUDF remains BVD free.
5. Johnes screening using the herd test milk samples has identified 7 Johnes positive cows (confirmed through blood tests). These will be added to the cull list (one is empty).
6. Trace minerals, including magnesium chloride are supplemented through the stock water to all cows on the milking platform extra selenium and iodine is also being added to increase levels pre winter.
7. 8 new lame cows this week 3 new mastitis cases
8. The farm continues to run 2 main herds plus the OAD herd. The make up of the small herd will change again this week .The small herd will now comprise of all cull cows and some later calving fat cows and these will be expected to clean up to a better residual mostly behind the big herd.
9. R2 heifers were teat sealed on the 19th April. They are being moved to their winter grazing tomorrow the 2nd May .They will be weighed drenched and will receive a B-12 plus selenium
10. R1 calves were weighed drenched and received a B-12 plus selenium and also given their lepto boster

11. The average whole herd liveweight has increased slightly this week by an average of 5Kg. The whole herd liveweight has changed with drying off 26 cows.
12. The herd was body condition scored on Monday 27 April. The average BCS for the whole herd was 4.2, 0.1 lower than previous month.



13. At 27th April CS event, the number of cows at BCS 4.0 or below had increased from 254 to 290, and the number of cows at 5.0 BCS or above had dropped from 66 to 63. Total cow numbers had also decreased from 529 to 489 as early calving light condition score cows were dried off.



14. The individual cow condition scores from late April are being used in conjunction with the dry-off rules presented below. These are used on an individual cow basis and assume cows are well fed once dried off, to enable sufficient time to get to their appropriate calving BCS targets.

15. Following these dry-off rules a further 38 cows will be dried off this Friday. 21 Rising three year olds and 13 mixed age cows - with current CS of 4 or less. 26 light cows and 13 lame cows and 5 low production cow have also been dried off to date.

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 fully feeding cows that have been dried off, i.e. - above maintenance levels.

Growing Conditions

16. The average 9 am soil temperature 11.3°C (compared to 10.6°C average for the previous week).

Figure 1: Soil temperature history for the last 2 weeks

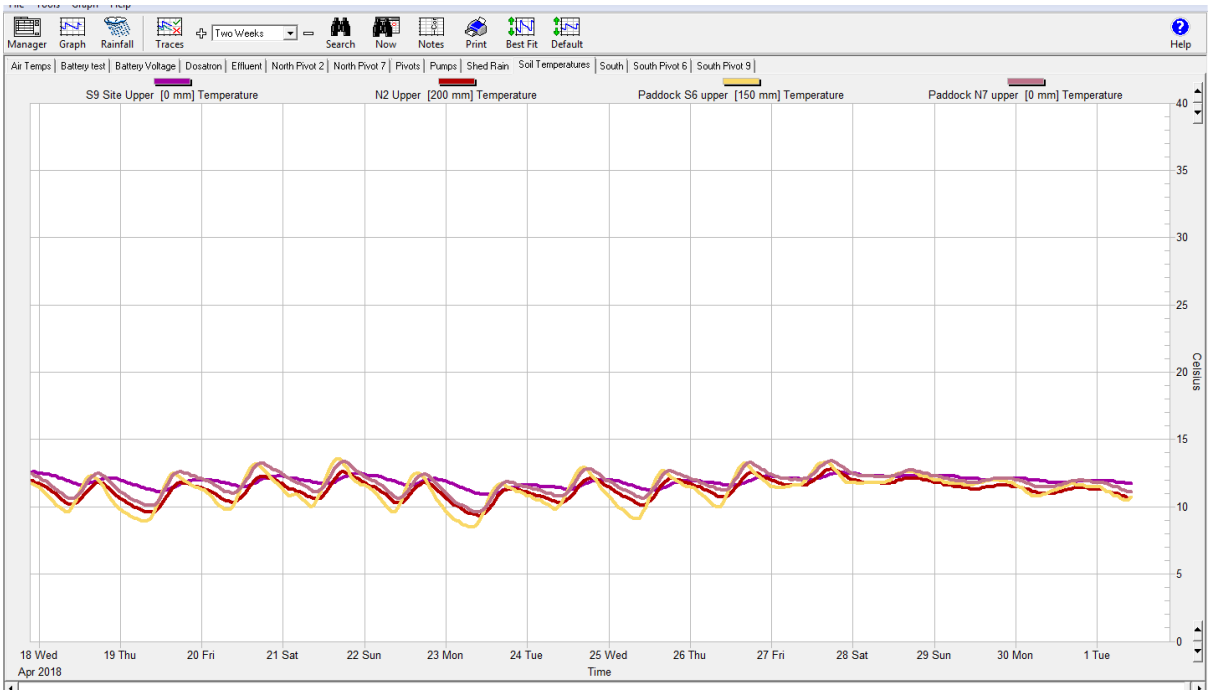
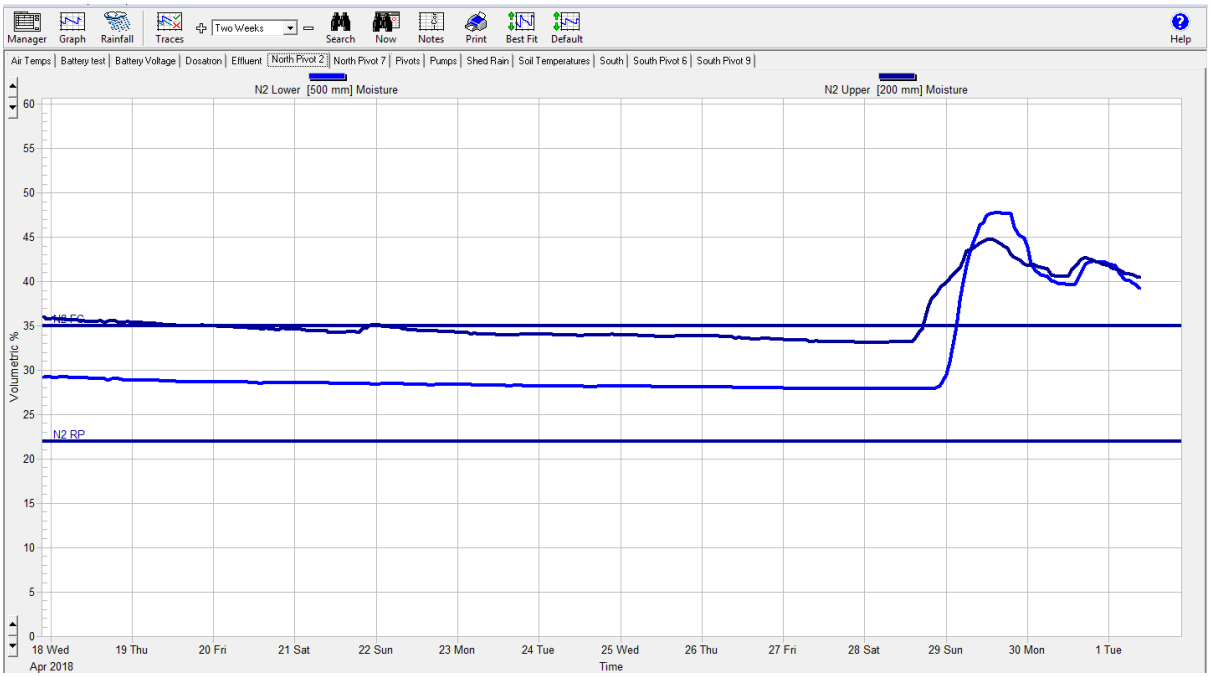


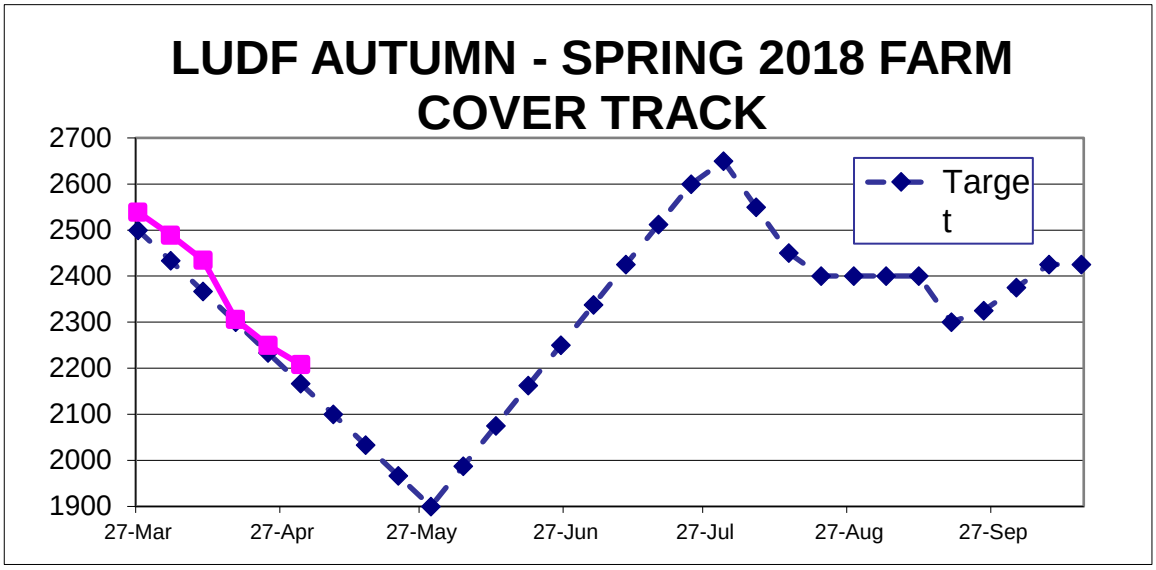
Figure 2: Soil moisture history for the last 2 weeks (Paddock N2).



17. 35.2 mm's of rainfall occurred this week which made the farm very wet over the weekend.
18. This week's graph represents the reading from the North Block moisture meters.

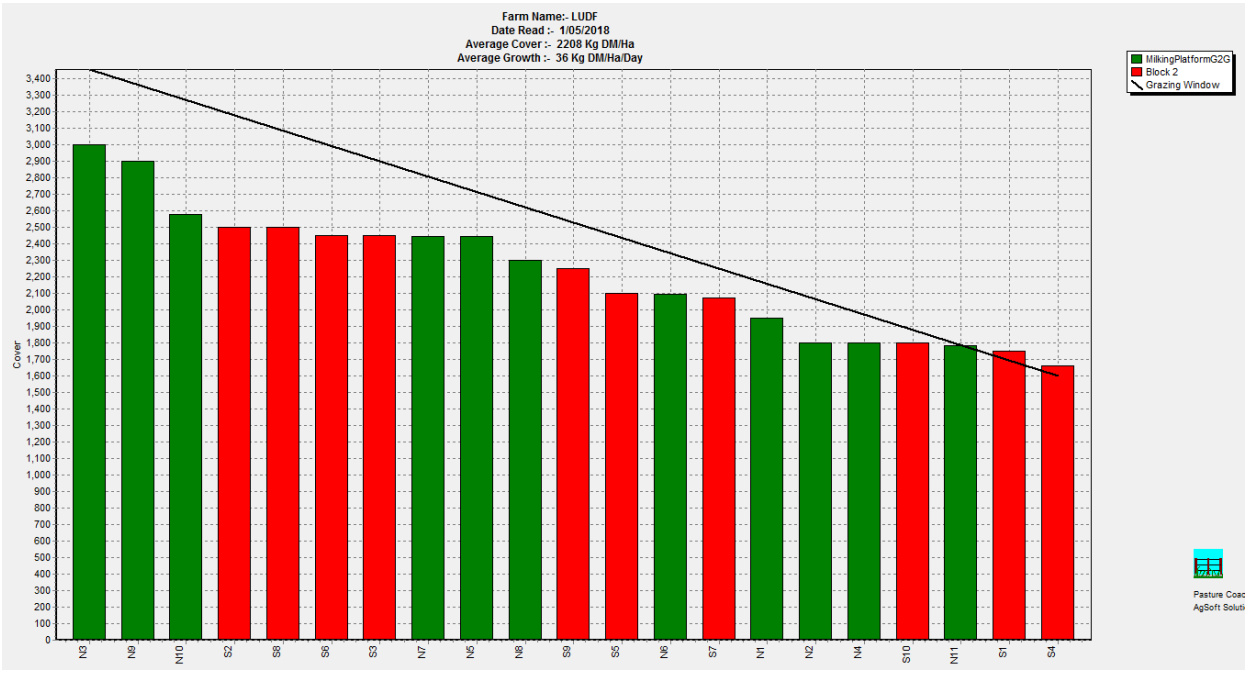
Pasture and Feed Management

19. Nitrogen has now finished for this season, (as growth will be more influenced by temperature than N from now on).
20. The total average Nitrogen application across the whole farm for the season is 178 kgN/ha
21. A total of nearly 25 t DM of silage was fed over the last week (average of 7.1 kgDM/ milking cow/day).
22. The farm grazed an average of 4.31 ha/day, giving a round length of 37 days.
23. Below is our autumn spring tracker that we will monitor over the next 6 months. The plan is to finish the season with an Average Pasture Cover of 1900Kg DM/ha which is lower than previous seasons. This is anticipating similar winter growth as in recent years (and acknowledges the amount of the farm in more winter active - hybrid perennial ryegrasses). The target APC at the end of July remains at 2600kgDM/ha and requires an average growth rate over the winter of 11.5kgDM/ha/day.



24. Average Pasture Cover decreased from 2250 kgDM/ha to 2208 kgDM/ha. This implies the growth rate plus silage fed is less than feed demand. The decrease of 56 kgDM/ha is equivalent to 6 kgDM/ha/day.
25. Based on a total demand of 59 kgDM/ha/day, less 21kgDM/ha/day as silage and 6 kgDM/ha/day from the decrease in APC implies a growth rate of 59-21-6 = 32 kgDM/ha/day. Pasture Coach calculated a GR of 36 kgDM/ha/day.

Figure 3: This week's feed wedge



26. The pregrazing required for the demand line assumes fully feeding cows on grass. It is calculated as follows:
    a. 496 cows eating 19 kgDM/cow/day = 9424 kgDM/day (Demand of 59 kgDM/ha/day over 160 ha)
    b. Target round length is a minimum 32 days. (160ha/32days) = 5 ha grazed/day
    c. 9424 kgDM/day / 5 ha/day = 1885 kgDM/ha
    d. Pre-graze cover required is therefore 1885 + 1600 = 3485 kgDM/ha if feeding solely on pasture.
    e. Pre-graze covers are approximately 3000kgDM/ha so the difference will continue to be made up from feeding silage and decreasing average pasture cover.
    f. Feeding silage at 6 kgDM/cow/day decreases demand to approx. 13 kgDM/cow/day (40 kgDM/ha/day from pasture).
    g. Demand from pasture is therefore 496 cows * 13 = 6448 kgDM, or 1300 kgDM/ha available pasture.
    h. With a target residual of 1600kgDM/ha and 1300kgDM/ha available feed this requires pregraze covers of 2900kgDM/ha.
27. Feed demand above is calculated using the following assumptions:
    a. Milk production of 1.36 kg MS/cow/day requires 95 MJME/day
    b. Maintenance and walking requires 70 MJME/day
    c. Average Weight gain of approx. 1 kgLWG/day requires 50 MJME/day
    d. Pregnancy - at this stage small, assume up to 1 kgDM /day or 10 MJME/day
    e. Total energy requirement is therefore 225 MJME/cow/day
    f. At average energy content of 11.8MJME/kgDM this equates to an intake of 19 kgDM/cow/day.
    g. There is no allowance for wastage or low utilisation in these calculations, 90% utilisation of the above feed requires feed offered increasing to 21 kgDM/cow/day and higher pregrazing covers.

Feeding Management for the coming week:

28. Milkers will continue to be fed on grass and grass silage as required to ensure a minimum round length of 32 days.
29. Pasture regrowth appears to be of good quality, with cows achieving good (and timely) grazing residuals.
30. The farm continues to hold culls on farm and in milk on the basis of the following calculations:
    a. Silage cost of 38 cents/kgDM (including feeding out costs) (48 cents if only 80% utilisation).
    b. Milk price of $6.55/kgMS
    c. Herd average production of 1.36 kgMS/cow (culls were 3% higher on last herd test and production has been a little higher over the past 2 weeks)
    d. Total revenue per day $8.91
    e. Total cost silage per day if sole diet fed as silage at 18.7 kgDM/cow/day = $7.10. This rises to $8.90/day at 80% utilisation.
31. The above calculation will differ across farms and assumes minimal additional costs for keeping culls in milk (eg staff and shed costs or changes in cull price over the season).
32. A total diet of silage is used in the above calculation as the removal of culls would reduce feed demand by approximately 12 kgDM/ha/day (100 culls * 19kgDM/cow/day / 160 ha) - and therefore reduce the need for some of the silage.

LUDF Weekly report	**10-Apr-18**	**17-Apr-18**	**24-Apr-18**	**1-May-18**
Farm grazing ha (available to milkers)	160	160	160	160
Dry Cows on farm / East blk /Jackies/other	12/0/0/0	12/0/0/0	6/0/0/40	7/0/0/39
Culls (Includes culls put down & empties)	0	0	0	0
Culls total to date	38	38	38	38
Deaths (Includes cows put down)	0	0	0	0
Deaths total to date	14	14	14	14
Calved Cows available (Peak No 560…)	524	524	490	490
Treatment / Sick mob total	3	6	7	4
Mastitis clinical treatment	0	3	4	3
Mastitis clinical YTD (tgt below 64 yr end)	58	61	65	68
Bulk milk SCC (tgt Avg below 150)	168	174	175	132
Lame new cases	4	4	2	8
Lame ytd	166	170	172	180
Lame days YTD (Tgt below 1000 yr end)	4239	4358	4393	4463
Milking twice a day into vat	505	501	478	473
Milking once a day into vat	16	17	5	13
Small herd	155	154	134	134
Main Herd	350	347	344	339
MS/cow/day (Act kg / Cows into vat only)	1.36	1.36	1.39	1.38
Milk Protein/Fat ratio	0.77	0.78	0.80	0.80
Milk Fat %	5.89	5.98	5.91	5.94
Milk Protein %	4.53	4.62	4.72	4.73
MS/cow to date (total kgs / Peak Cows 560	403	413	420	430
MS/ha/day (total kgs / ha used	4.42	4.39	4.21	4.18
Herd Average Cond'n Score	4.3	4.3	0.00	4.20
Monitor grp LWkg WOW 281 early calvers	494	497	494	501
Soil Temp Avg Aquaflex	13.6	9.7	10.6	11.3
Growth Rate (kgDM/ha/day)	48	34	32	36
Plate meter height - ave half-cms	13.8	12.9	12.5	12.2

LUDF Weekly report	10-Apr-18	17-Apr-18	24-Apr-18	1-May-18
Ave Pasture Cover (x140 + 500)	2435	2306	2250	2208
Surplus/[defict] on feed wedge- tonnes	0	0	0	0
Pre Grazing cover (ave for week)	3211	3188	3061	2997
Post Grazing cover (ave for week)	1550	1550	1550	1600
Highest pregrazing cover	3335	3290	3100	3100
Area grazed / day (ave for week)	4.95	4.80	4.32	4.31
Grazing Interval	32	33	37	37
Mowed pre or post grazing YTD	183.3	183.3	183.3	183.3
Total area mowed YTD	224.3	224.3	224.3	224.3
Supplements fed to date kg per cow (555peak)	387.0	428.5	461.9	505.9
Supplements Made Kg DM / ha cumulative	308.5	308.5	308.5	308.5
Units N applied/ha and % of farm	0	0	0	0
Kgs N to Date (whole farm)	178	178	178	178
Rainfall (mm)	20	26.8	9	35.2
Aquaflex topsoil relative to fill point target 60 - 80%	70-90	90-100	70-90	100-100

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