SIDDC
South Island Dairying Development Centre

LINCOLN UNIVERSITY
DEMONSTRATION DAIRY FARM

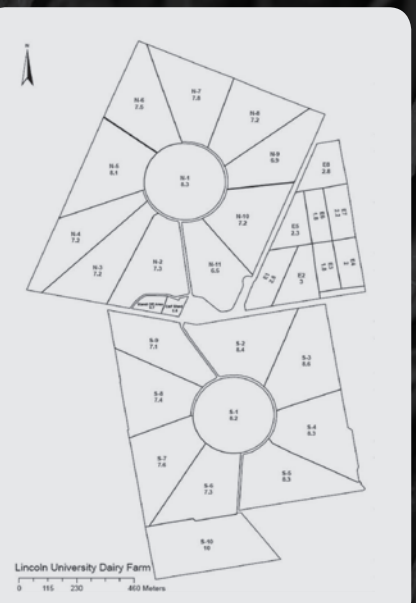
MAY 2017
FOCUS DAY

STAFF

Peter Hancox	– Farm Manager
Sean Collins	– 2IC
Matthew Costello	– Dairy Assistant
Tom Chapman	– Dairy Assistant

LUDDF 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
Te Whare Wānaka o Aoraki
AOTEAROA · NEW ZEALAND
New Zealand's specialist land-based university

DairyNZ

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Plant & Food RESEARCH
RANGAHAU AHUMĀRA KAI

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SIDE
SOUTH ISLAND DAIRY EVENT

INTRODUCTION

The LUDDF 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. LUDDF 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 LUDDF 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: 2014/15

LUDDF 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.

LUDDF 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

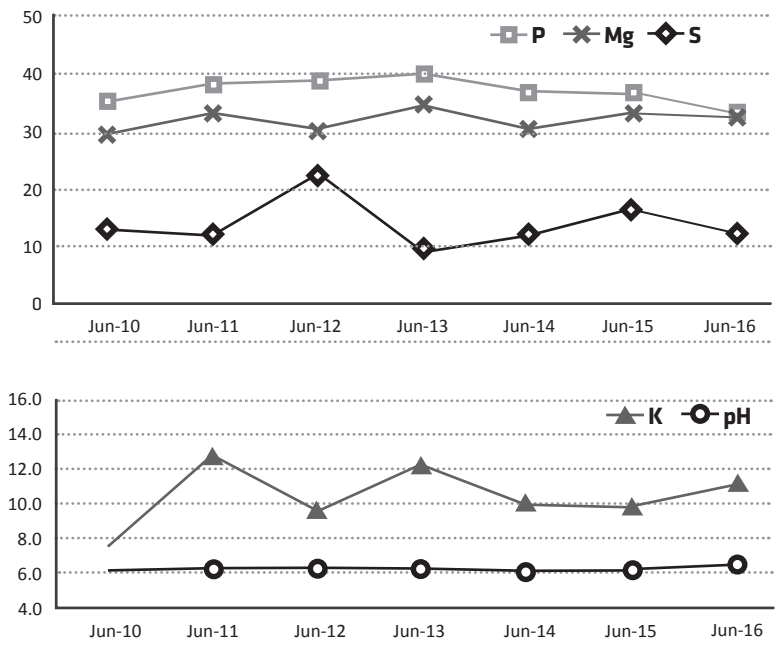
Target Soil Test Ranges:

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

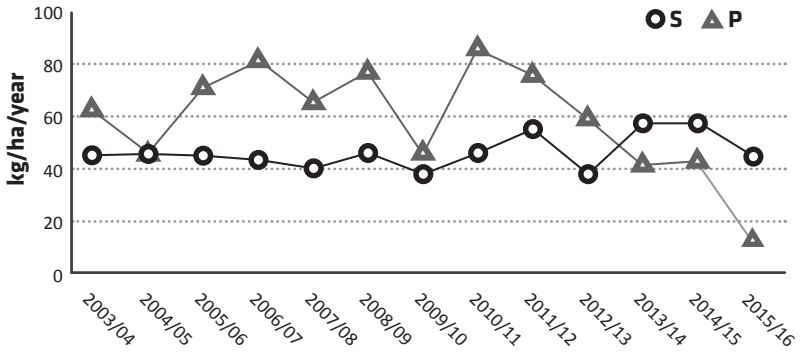
PASTURE

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 – 2015/16



Paddock	Period Regrassed	Grass Cultivar
N1	Feb-01	Brons. Imp
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	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
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-08	Arrow - Alto
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 2016

KiwiX DNA for 365 cows [F8-F16]; Holstein Friesian Daughter Proven for 280 cows [F0-F7 then follow with Jersey bulls. Heifers start mating 10 days early, Syncro + AI the natural mate for 9 weeks. 10 weeks mating for milking herd. Expect to rear 150 heifers.

HERD DETAILS – OCTOBER 2016

Breeding Worth (rel %) 99 / 46
Production Worth (rel%) 128 / 66
Recorded Ancestry 99%

Average weight / cow (Dec)
Herd monitored walk over weighing
488 kg [Dec 2015]

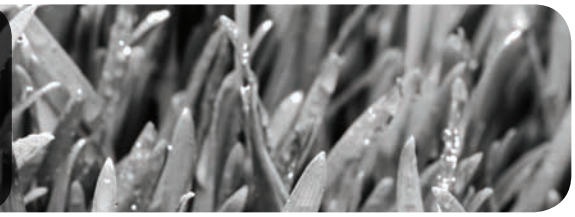
Calving start date 2016
Heifers 18 July, Herd 1 August

Est. Median calving date
12 August 2016

Mating start date
25 October 2016 (heifers 10 days earlier)

Empty rate (nil induction policy) after 10 weeks mating - 14% (2015-16 mating). 6 week in-calf rate 69%.

	2002/03	2003-07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Total kg/MS supplied	228,420	**277,204**	278,560	261,423	273,605	262,112	297,740	300,484	276,019	278,654	289,906
Average kg/MS/cow	381	**425**	409	384	415	391	471	477	440	498	522
Average kg/MS/ha	1,414	**1,720**	1,744	1,634	1,710	1,638	1,861	1,878	1,725	1742	1812
Farm working expenses /kgMS	$2.98	**$2.68**	$3.37	$3.88	$3.38	$3.86	$3.91	$3.84	$4.28	$3.87	$3.47
Dairy operating profit/ha	$1,164	**$2,534**	$8,284	$2,004	$4,696	$6,721	$4,553	$4,665	$7,578	$1200	$1182
Payout (excl. levy) $/kg (Milk price + div)	$4.10	**$4.33**	$7.87	$5.25	$6.37	$7.80	$6.30	$6.12	$8.50F	$4.60	$4.30
Return on assets	4.4%	**6.18%**	14.6%	4.8%	7%	7%	6%	6%	10%	1.6%	1.6%
1 July cow numbers	631	**675**	704	704	685	694	665	650	650	580	578
Max. cows milked	604	**654**	680	683	660	669	632	630	628	560	555
Days in milk	-	**-**	263	254	266	271	272	273	259	263	267
Stocking rate cow equiv./ha	3.75	**4.05**	4.2	4.3	4.13	4.18	3.95	3.94	3.92	3.5	3.47
Stocking rate Kg liveweight/ha	1,838	**1964**	2,058	2,107	1,941	1914	1860	1878	1872	1680	1724
No. cows/weeks wintered off	500/8	**515/7.8**	546/9	547/7	570/9	652/8.4	650/9.8	650/9.8	650/11.4	580/10.7	578/11.6
No. yearlings grazed - On/Off	0/118	**0/157**	0/171	0/200	0/160	0/166	0/141	0/138	0/140	0/126	0/126
No. calves grazed - On/Off	0/141	**0/163**	0/200	0/170	0/160	0/194	0/190	0/156	0/150	0/126	0/155
Past eaten (dairybase) (tDM/ha)	-	**-**	17.9	17.2	16.2	16.9	17.3	16.8	14.9	15.7	16.6
Purch. Suppl - fed (kgDM/cow)	550	**317**	415	342	259	463	359	434	506.8	300	126
Made on dairy/platform (kgDM/cow)	0	**194**	95	64	144	160	154	93	0	40	277
Applied N/160 eff. Ha	-	**-**	164	200	185	256	340	351	252	143	179



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LUDF Farm System Overview:

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.*

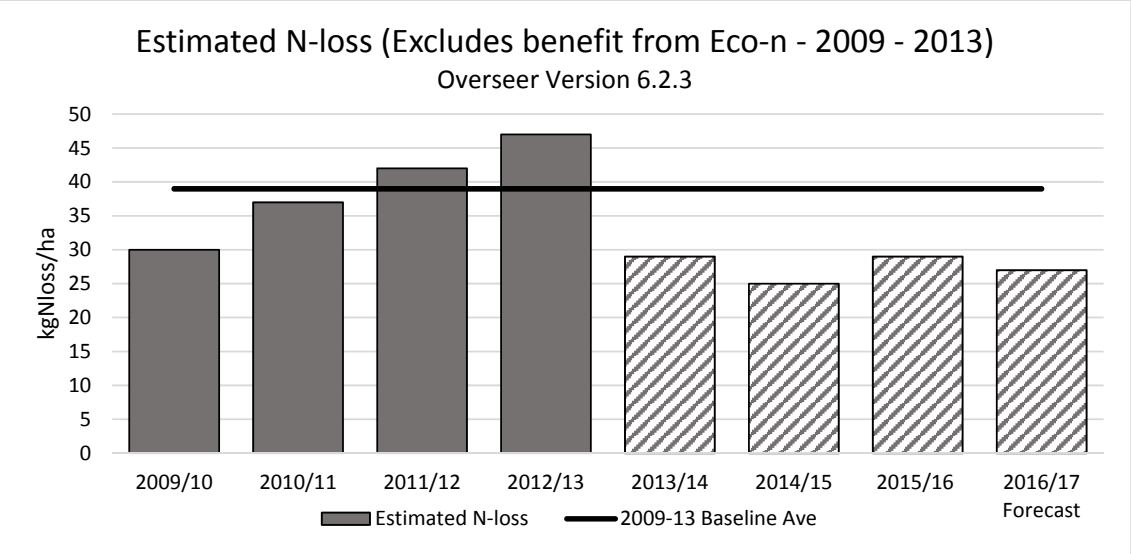
To achieve the above objectives, and considering the changing environmental regulations to reduce nutrient losses, LUDF has since the beginning of the 2014/15 season adopted and scaled up research emerging from the P21 Phase 2 programme. This research (jointly funded by the Ministry of Business, Innovation 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.

Overview of Low Input, Highly Productive and Profitable, Low Nutrient Loss Farm System

	Initial Target	2014/15 Result	2015/16 Result
Stocking Rate	3.5 cows /ha		
Nitrogen Fertiliser Input	150 kgN/ha	143 kgN/ha	179 kgN/ha
Imported Supplement (Plus effectively all cows wintered off farm)	300 kgDM/cow		126 kgDM/cow
Milk Production	500 kgMS/cow and 1750 kgMS/ha	498 kgMS/cow and 1742 kgMS/ha	522 kgMS/cow and 1812 kgMS/ha
Farm Working Expenses	$4.00 /kgMS	$3.87 /kgMS	$3.47 /kgMS

Results from the 2014-15 season identified the system was scalable, but could be improved at LUDF. In particular, the research had not included any regrassing, where-as LUDF, based on prior identification of poorer performing paddocks planned to, and regrassed 3 paddocks (15%) in the 2014-15 season. This put considerable pressure on the farms feed supply, so the plan was reduced to 10% in 2015-16. The reduction in payout subsequently led to this being restricted to only 5% last season. This was a much more manageable area in a low input system and contributed to generating a surplus of home grown silage that was cost effectively fed back to extend lactation of 'cull' cows.

Environmental footprint: estimated Nitrogen Loss with Overseer



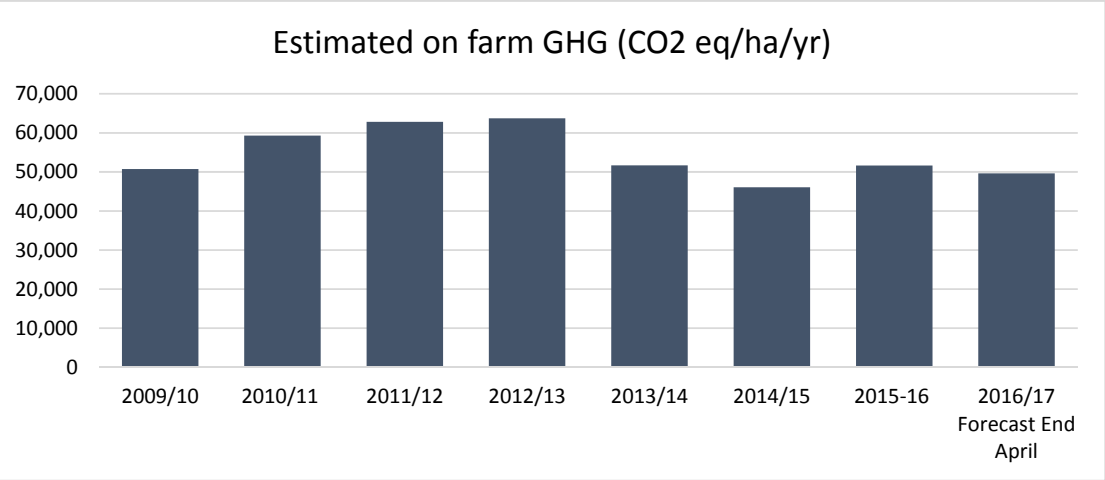
Estimated N losses for LUDF, compared to baseline as calculated using Overseer®.

Overseer estimated the farm system in 2014-15 reduced its N-leaching by over 30% (compared to the 2009-13 baseline period), providing confidence the farm could allow the use of a little more Nitrogen fertiliser to push total drymatter production, milk production and profitability in the 2015-16 and 2016-17 seasons. Total N applied as fertiliser therefore increased from 143 kgN/ha to 179kgN/ha last season and 173 kgN/ha this year. The additional Nitrogen was largely applied in the late spring / summer when irrigation plus Nitrogen was likely to give high N-response rates.

Note Stocking rate, inputs and productivity have varied significantly over the period from 2009/10. See the annual on farm statistics at the front of the handout for more details.

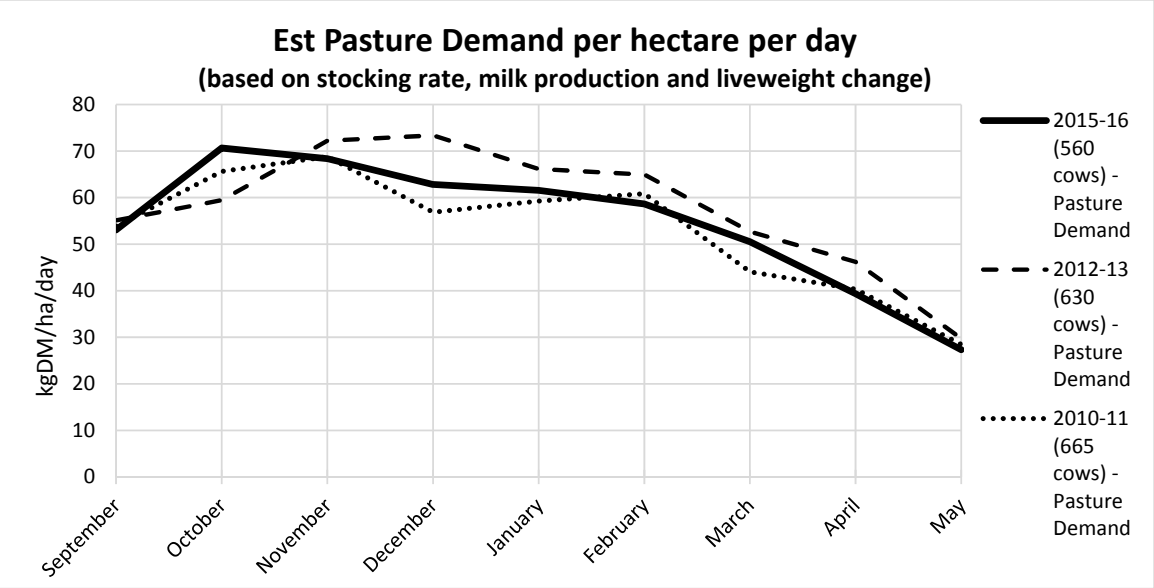
Greenhouse Gas Emissions Over Time:

Overseer® can also model the farms likely greenhouse gas emissions. This broadly shows the farms system change to reduce N leaching has also reduced greenhouse gas emissions compared to the 2011-12 and 2012-13 seasons.



Feed Conversion Efficiency

Using the energy requirements for maintenance, walking, change in CS and milk production, enables calculation of the proportion of pasture consumed for milk production to be compared to that required for maintenance. Total pasture consumed and used in milk production has increased since 2010-11 and changed from 61% of pasture eaten to 69% pasture. The farm is thus now both 'harvesting' more pasture, AND turning this into more milk for sale.

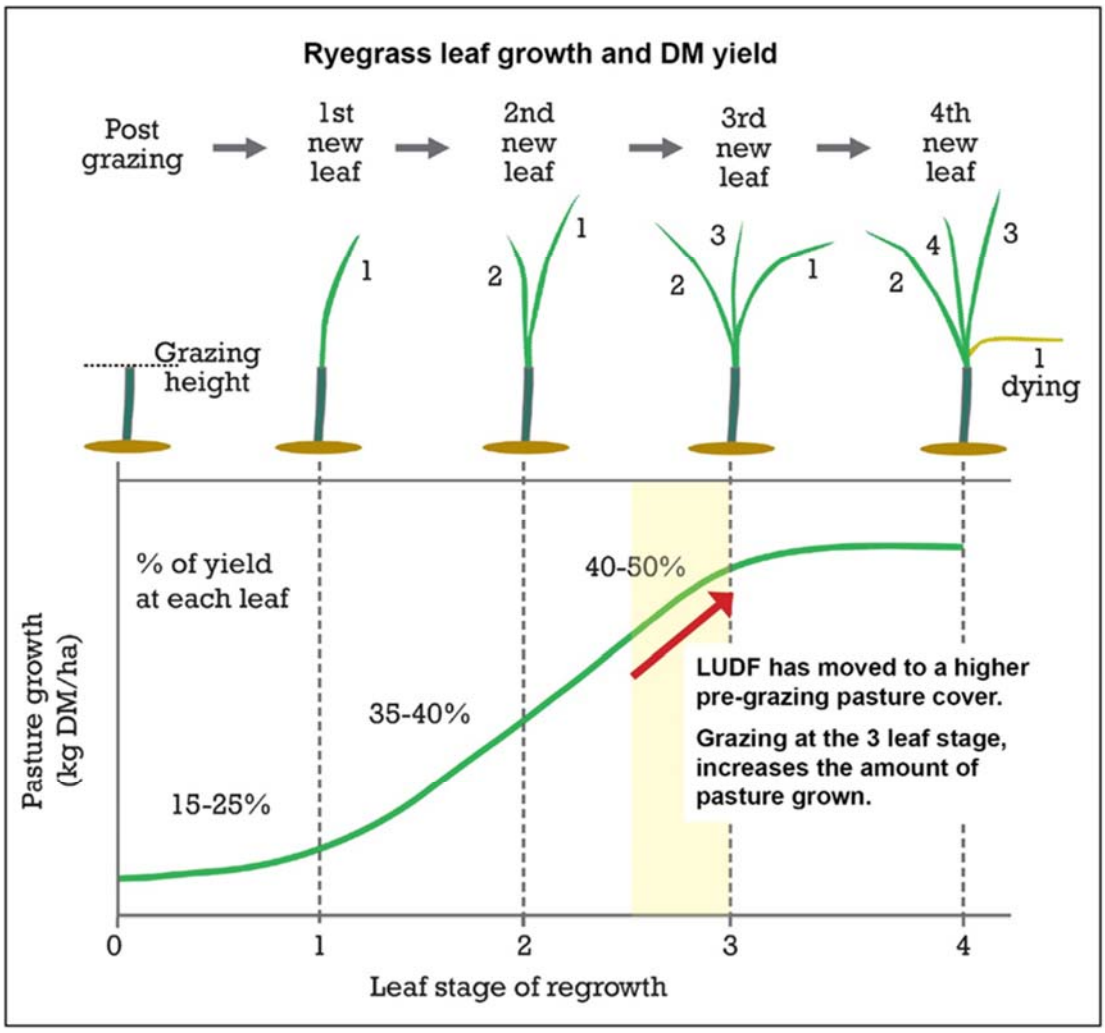


Ryegrass – the 3 leaf principal:

A key reason for the increase in pasture grown (and harvested) is the increase in pre-grazing pasture cover (by around 200 kgDM/ha). The science behind this is shown in the diagram below.

The farm has moved from grazing ryegrass at around *2.5 leaves/tiller* to around *3 leaves/tiller*. This has a significant effect as 40-50% of the ryegrass DM yield in a regrowth cycle is produced with the third leaf. Simply put "grass grows grass", and with more leaves the pasture captures more light, has greater photosynthesis, and grows faster.

Post-grazing residuals have remained similar to previously (averaged across the whole season) and a consistent, even post-grazing residual remains a key requirement for LUDF. Running higher pre-grazing covers means the grazing round is longer (by an average of 6 days) and each paddock will be grazed 1-2 times less over the season (this also reduces N application when applied following each grazing).



Two other things are key to managing higher pre-grazing covers (as LUDF has):

- Tetraploid ryegrass, or a tetraploid/diploid ryegrass mix, have a significant advantage for this system. On LUDF 19 of its 21 paddocks have tetraploids, which maintain high cow intakes (in a timely manner) at higher covers. Whereas cows may struggle to graze a straight diploid ryegrass >3300 kgDM/ha, a tetraploid/diploid mix can typically still be well grazed at up to 3600 kgDM/ha (assuming low and consistent grazing residuals in prior grazings).
- Pasture quality issues however can occur more quickly with longer grazing rounds and higher pre-graze covers. Pasture ME can still be very high (12+) at the 3 leaf/tiller stage of ryegrass growth, but beyond this it starts to drop off. Having higher covers means your farm is growing more, and you can move past 3 leaves/tiller into lower quality issues more quickly. Monitoring and controlling pasture quality when necessary (e.g. pre-graze mowing, making silage) are important.

Pre-graze mowing and pasture height experiment

- preliminary results

Paul Edwards, Anna Clement, Jane Kay - DairyNZ
Racheal Bryant - Lincoln University

Ministry for Primary Industries
Manatū Ahu Matua
With funding support from the Sustainable Farming Fund

DairyNZ

Background

The use of pre-graze mowing in NZ has increased

Potential benefits

- increased DM and ME intake
- reduced energy expended in foraging and harvesting pasture
- increased MS production

Background

Potential to capture additional pasture growth

- higher pre-graze cover / longer rounds
- difficult to hit residual by grazing without restricting intake

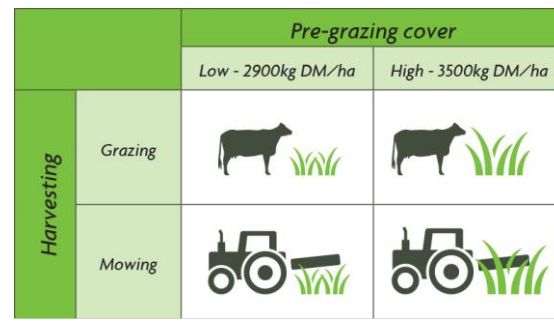
Higher covers, longer rounds and mowing

- Potentially convert additional growth (surplus) into MS by increasing cow intake

Treatments

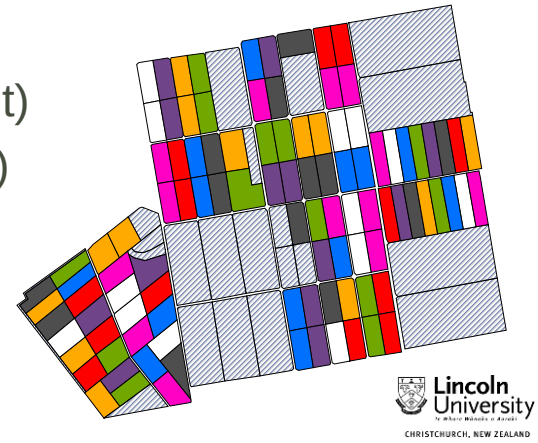
Four treatments

1. Pre-graze height
   - Low – 2900 kg DM/ha
   - High – 3500 kg DM/ha
2. Harvesting
   - Pre-graze mowing
   - Grazing



Experiment

LURDF



- 8 farmlets (2 reps/treatment)
- 144 cows (18 cows/farmlet)
- 39 ha (3.7 cows/ha)
- 13 paddocks/farmlet
- 4 months (Oct-Feb, 120 d)

- Reduced to 16 cows/farmlet (3.3 cows/ha) in Dec

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Farmlet management

- Weekly feed wedge for each farmlet
- Residuals fixed - aim 4 cm (7-8 clicks)
- Similar total N applied
- Rotation length not fixed i.e. cows can be moved on if they have finished their break or returned to paddocks if not finished
- Mowing at ~2 hr before new break

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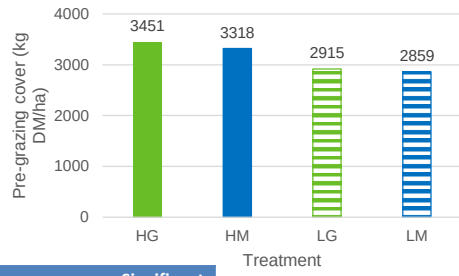
Mower

Decision rules

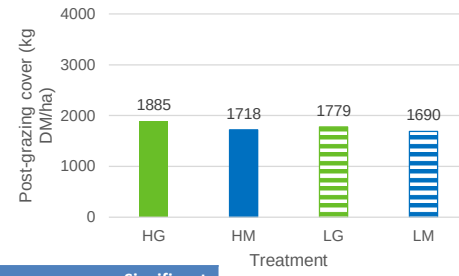
- Maintain average pasture cover (winter equation)
  - Low = 2050 – 2350
  - High = 2350 – 2650
- Maintain pre-grazing yields
  - Low = 2900 ± 100 kg DM/ha
  - High = 3500 ± 100 kg DM/ha
- Surplus harvested if > 5% above target yields
  - Low > 3045 kg DM/ha
  - High > 3625 kg DM/ha

Preliminary results – pre/post

- Achieved target pre-grazing covers (except HM), but residuals higher



Effect	Significant
Pre-grazing cover	✓
Harvesting method	✗
Interaction	✗



Effect	Significant
Pre-grazing cover	✓
Harvesting method	✓
Interaction	✓

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Pre-grazing cover

DairyNZ

Post-grazing residuals




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Preliminary mowing wastage

Treatment	Wastage (kg DM/ha)
HM	190
LM	143
Average	**166**

- Equivalent to 2 kg DM/cow/d over the experiment

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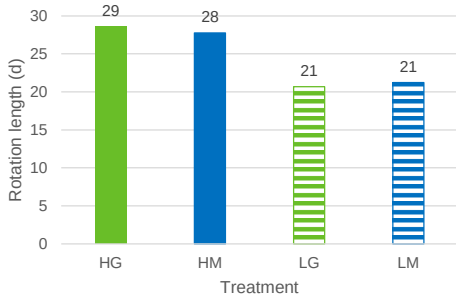
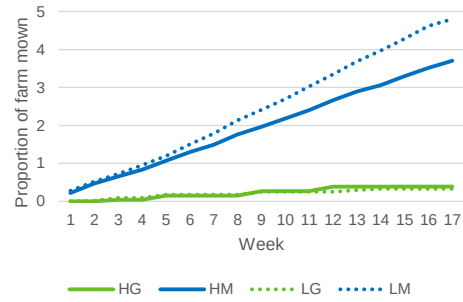
Preliminary results - rotation



Effect	Significant
Pre-grazing cover	✓
Harvesting method	✗
Interaction	✓

- LM farmlet mown more times due to faster round = higher cost than HM



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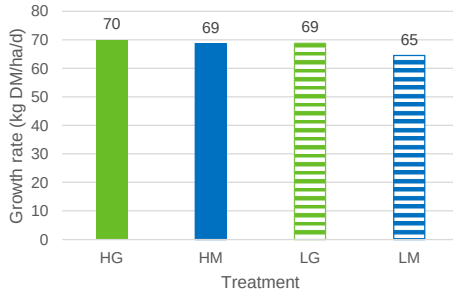
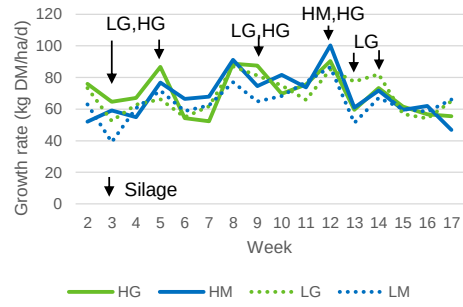
Preliminary results – growth



Effect	Significant
Pre-grazing cover	✗
Harvesting method	✗
Interaction	✗

- Growth rate notoriously hard to detect difference



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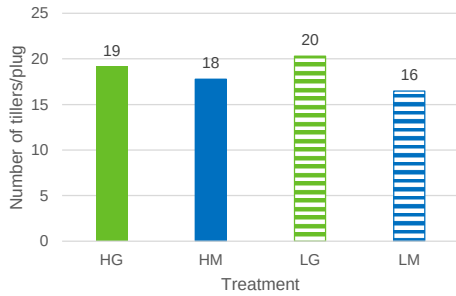
Preliminary results – tillers

- Mowing decreased tiller numbers
- Similar to overseas research



Effect	Significant
Pre-grazing cover	✗
Harvesting method	✓
Interaction	✗

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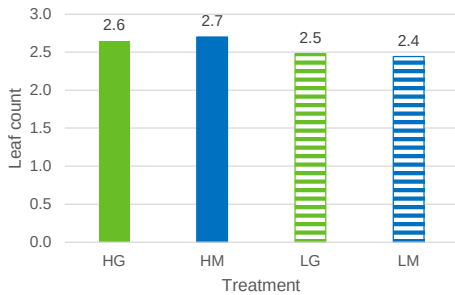
Preliminary results – leaf count

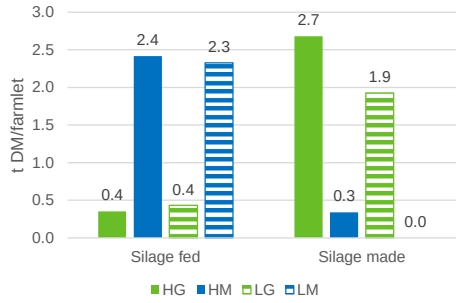
- Greater leaf numbers with higher covers
- Smaller difference than expected



Effect	Significant
Pre-grazing cover	✓
Harvesting method	✗
Interaction	✗

DairyNZ

Preliminary results - silage



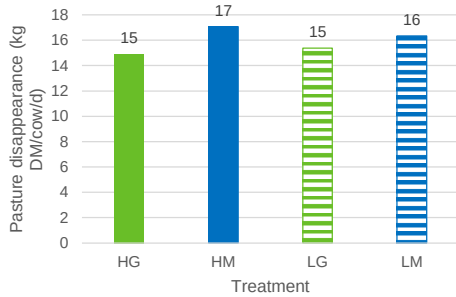
Effect	Significant
Pre-grazing cover	✗
Harvesting method	✓
Interaction	✗

	HG	HM	LG	LM
Silage made minus fed (t DM)	2.3	-2.1	1.5	-2.3
Silage fed (kg DM/cow/d)	0.2	1.2	0.2	1.2
Equivalent growth rate	1	4	1	4

- 1 kg DM/cow/d more silage fed out to mowing treatments over experiment

DairyNZ

Preliminary results - feeding



Effect	Significant
Pre-grazing cover	✗
Harvesting method	✓
Interaction	✗

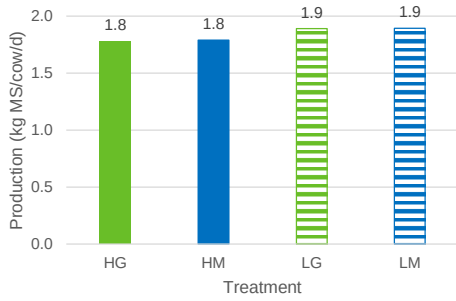
- More pasture disappearance with mowing

<u>BUT</u>

- More wastage with mowing (-2)
- More silage fed in mowing farmlets (+1)

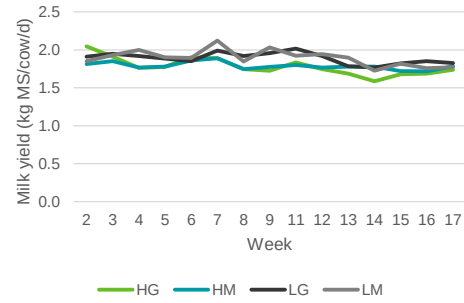
DairyNZ

Preliminary results - production



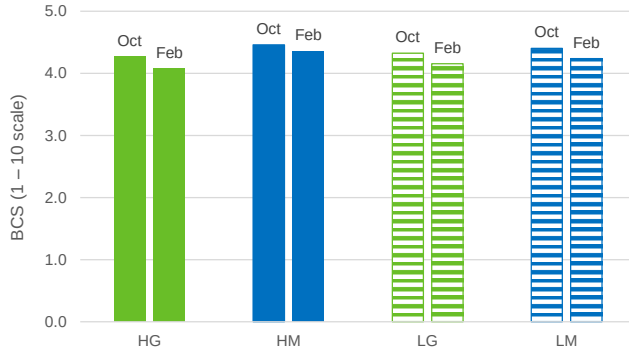
Effect	Significant
Pre-grazing cover	✓
Harvesting method	✗
Interaction	✗

- Lower production on high cover treatments
- No effect of mowing



DairyNZ

Preliminary results – BCS

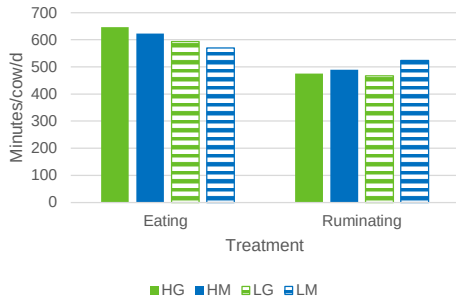


Effect	Significant
Pre-grazing cover	✗
Harvesting method	✗
Interaction	✗

- No difference in BCS change throughout the experiment

DairyNZ

Preliminary results - behaviour



Effect	Eating Sig	Ruminating Sig
Pre-grazing cover	✓	×
Harvesting method	✓	×
Interaction	×	×

- Cows eating mown material spent less time eating
- Cow eating high pre-grazing covers spent longer eating
- No effect on rumination time

DairyNZ

General observations

- No pasture composition results **yet** – need this to fully understand the results
- No difference in N applied, average 146 kg N/ha
- ~70% of paddocks diploid
- Could mow 0.75ha/hr – small paddocks!
- Grazing less stressful to manage than mowing
- Mowing makes the farm look pretty!

DairyNZ

Discussion points

- What is the effect of mowing tactically?
- How does mowing compare to ‘averagely’ managed grazing treatments?

Conclusions

1. No benefit in animal performance in mowing treatments
2. +6% milk production from low cover v high cover
3. No significant difference in pasture growth rate but more silage fed in mowing treatments
4. 150-200 kg DM/ha left behind after mowing

Ketosis Trail Results

Will treating cows with elevated blood ketones improve their health and productivity?

4th May 2017

Background:

- Following calving, cows undergo a period of negative energy balance as their energy output in milk production is greater than their dietary energy intake. To supply the extra energy to support her strong drive for milk production, the dairy cow mobilises body tissue (primarily fat), which is detected as a loss of body condition score (BCS). When the negative energy balance is severe, the liver cannot use all the fat that is mobilised to generate energy. Instead, some of the fat is converted to ketone bodies (acetone, acetoacetate, and β-hydroxybutyrate (BHB)), which can then supply the dairy cow with energy. If the concentration of BHB in the blood is very elevated (≥3.0 mmol/L), it is associated with a metabolic disorder known as clinical ketosis. Clinical ketosis may present in either lethargic or nervous/excitable forms, often with a characteristic sweet smell on the breath and requires treatment. However, cows are far more likely to have moderately elevated concentrations of ketones in the blood (BHB ≥1.2 to <3.0 mmol/L) and the consequences of these are uncertain.
- Data from cows fed total mixed rations in confinement systems, indicates that blood BHB concentrations ≥1.2 mmol/L are indicative of subclinical ketosis (SCK) and can reduce cow performance. However, blood BHB is also derived from the diet and cows fed predominantly forage diets (e.g. pasture or pasture silage) have greater basal BHB concentrations than those eating a diet high in starch (e.g. total mixed ration or grains). **Therefore, in cows fed pasture, blood BHB concentrations between 1.2 and 3.0 mmol/L are not always associated with SCK and/or reduced performance.**
- With this in mind, a NZ study (by Cognosco) indicated that, on average, 68% of cows in a herd had blood BHB ≥1.2 mmol/L at some stage during the first 5 weeks post-calving (when tested at weekly intervals). However, there was huge variation (10% to 100% of cows) across the herds studied.
- Results from this study were consistent with overseas data in that it found that cows with blood BHB ≥1.2 mmol/L within the first 5 days post-calving had a 2.5x greater risk of a positive metricheck score (indicating a clinical uterine infection) at 5 weeks post-calving. Furthermore, if blood BHB concentrations were ≥1.2 mmol/L at any stage during the first 5 weeks of lactation, it was associated with a 7% lower 6 week in-calf rate.
- Monopropylene glycol (MPG) drench (i.e. the active ingredient in Ketol) is commonly used to provide downer or sick cows with a readily absorbed source of glucose to restore energy levels.
- Recent overseas studies in housed systems indicate that treating cows with moderately elevated blood BHB (≥1.2 to <3.0 mmol/L) with a MPG drench in early lactation can improve

reproduction, animal health, and milk production, and can reduce removal rates from the herd.

- Although the previous Cognosco study indicated a high number of cows with elevated blood BHB concentrations in NZ dairy herds, it is unknown if this type of treatment would be effective in our pasture-based system. Therefore, a large-scale trial was initiated to test the association between blood BHB concentrations and cow performance, and the effect of treatment with MPG.

Objective: To determine the effect of treating cows with moderately elevated blood BHB concentrations (≥1.2 to <3.0 mmol/L) with a MPG drench on animal health, milk production and reproductive performance in a pasture-based system.

Trial Design:

- 1000 cows were enrolled across 3 farms (Scott, Waikato; TARS, Taranaki; LUDF, Canterbury) during calving 2016 and were randomly allocated to either a control or treatment group.
- Each cow was tested for circulating BHB concentrations 3 times per week for 5 weeks post-calving by taking a blood "prick" sample and using a hand-held meter device.
- If cows in the control group tested positive for moderately elevated BHB (≥1.2 to <3.0 mmol/L) they were not treated at any stage.
- If cows in the treatment group tested positive they were given a daily drench of MPG until BHB went below 1.2 mmol/L.
- If cows in either control or treatment groups had very elevated BHB (≥3.0 mmol/L), they were given Ketol drench twice daily for 3 days with veterinary treatment sought if clinical symptoms were present.

Results to date:

- The percentage of cows in the herd with elevated blood BHB concentrations varied between farms. Approx. 65-82% of cows had at least one test with moderately elevated BHB concentrations during the first 5 weeks of lactation (Table 1). About 6-18% of cows had very elevated BHB (Table 1).
- Most cows first had elevated BHB (≥1.2 to <3.0 mmol/L) in the 1-2 weeks immediately post-calving (i.e. incidence of new cases – see Figure 1).
- The % of cows that had elevated BHB (≥1.2 to <3.0 mmol/L) on each day in milk (DIM) was greatest in the first 10 days post-calving, but ~10-25% of cows still tested positive each day between 21 and 28 DIM (i.e. prevalence – see Figure 2).

Table 1. The % of cows with elevated blood BHB concentrations across 3 farms

	LUDF	Scott	WTARS	Herd-Level Mean
No. of cows	426	292	249	**967 (total)**
% of cows with at least one test **BHB ≥1.2 to <3.0 mmol/L**	82%	65%	80%	**75%**
% of cows with at least one test **BHB ≥3.0 mmol/L**	6%	12%	18%	**12%**

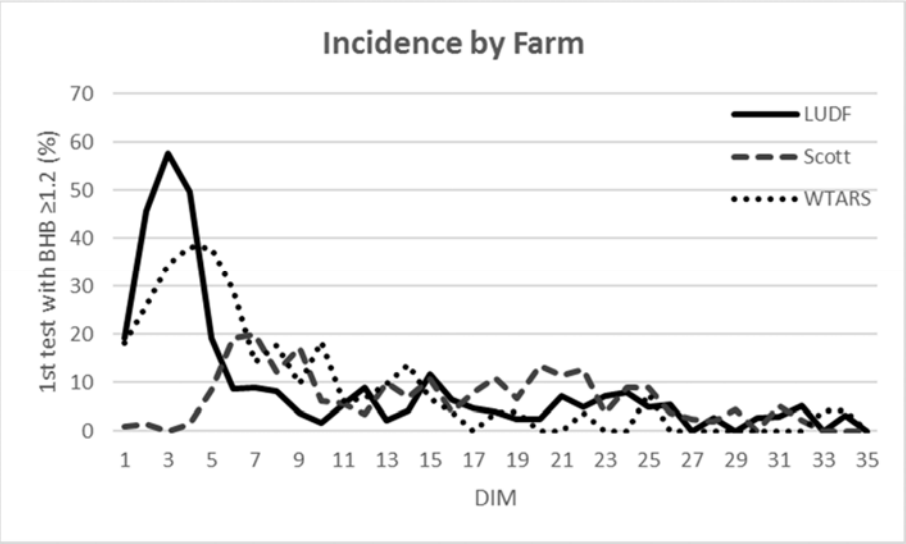


Figure 1. The % of cows with new cases of elevated BHB across 3 farms

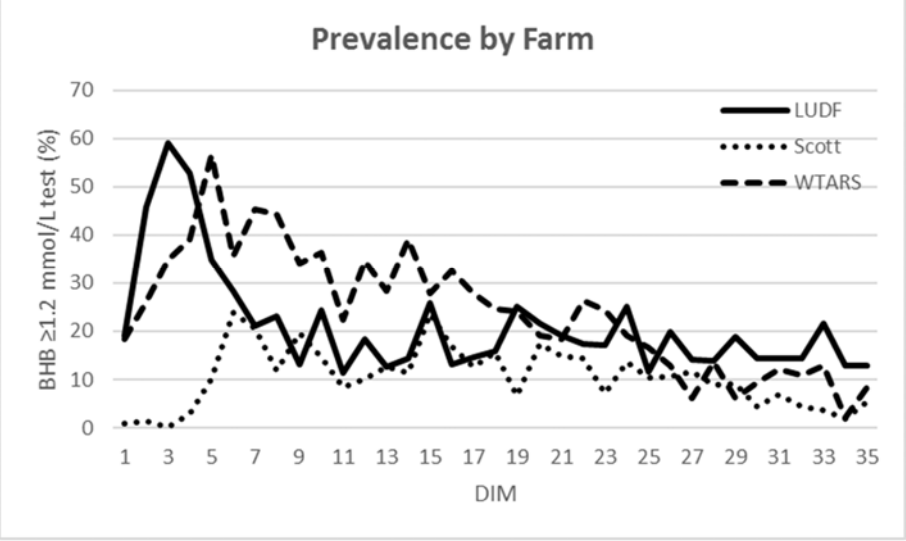


Figure 2. The daily % of cows that had elevated BHB across 3 farms

- Without MPG treatment, it took 3-6 days for an episode of elevated BHB to resolve naturally to at least one test at BHB below 1.2 mmol/L, but 6-10 days for 2 consecutive tests at BHB below 1.2 mmol/L. The higher the BHB concentration and the earlier the DIM at the first elevated test, the longer it took for cows to resolve naturally.
- Generally, cows that tested positive for elevated BHB were older, higher producers, had a greater live weight and BCS at calving, and lost more live weight and BCS post-calving.
- Unlike the previous Cognosco study, we were not able to detect a consistent association between elevated blood BHB (≥1.2 mmol/L) and lower 6 wk in-calf rates in the 3 herds studied. If a higher threshold for BHB concentrations was used, elevated BHB (≥1.6 mmol/L) were associated with a lower 6-wk in-calf rate at LUDF, but the opposite relationship was detected at TARS farm, as elevated BHB (≥1.4 mmol/L) were associated with a greater 6 wk in-calf rate. Therefore, the relationship varies between herds. We are now examining the dataset to determine if the pattern of elevated BHB concentrations post-calving and factors such as age, breed, BCS etc. can explain this relationship.
- Drenching cows with MPG (at blood tests of BHB between 1.2 to 3.0 mmol/L) reduced the percentage of animals with moderately elevated BHB during the first 5 weeks of lactation (Figure 3). It also helped to shorten the duration of very elevated BHB (≥3.0 mmol/L) episodes when they occurred.

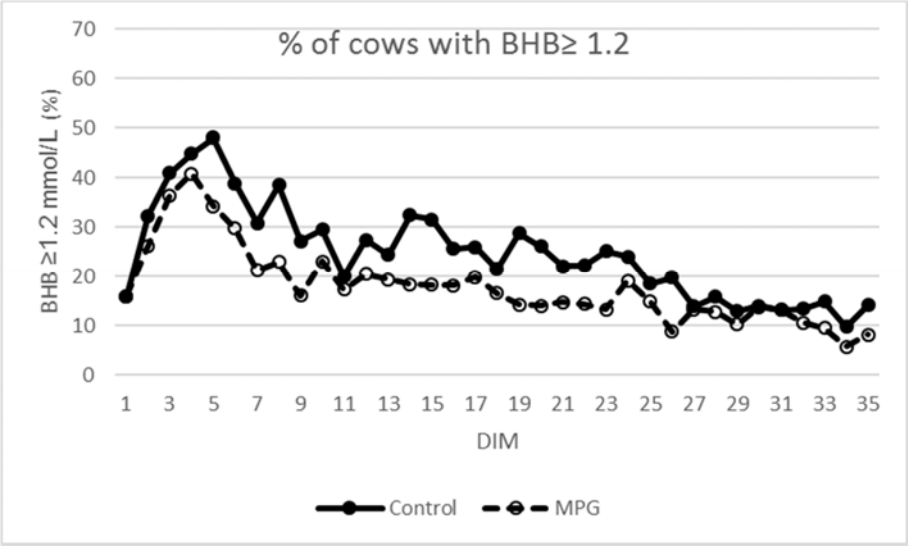


Figure 3. Effect of drenching cows at BHB ≥1.2 to <3.0 mmol/L with MPG on the % of cows testing above BHB ≥1.2 mmol/L during the first 5 weeks of lactation.

- However, there were no consistent effects of MPG treatment of cows with elevated BHB concentrations on reproductive outcomes between the 3 herds studied. Farms varied in their response to MPG. Furthermore, at TARS farm, 6-wk in-calf rate declined in cows that were treated with MPG, and this effect became stronger when the BHB threshold for treatment (≥ 1.2, 1.4, 1.6, 1.8 mmol/L etc.) increased.

- These results indicate that, unlike in overseas housed cows, using a MPG drench to treat moderately elevated BHB concentrations is not a wide-spread strategy to improve performance in pasture-based cows and may, in some cases, have adverse effects.
- However, as the farm response to MPG varied, further analyses of the dataset are currently being conducted to investigate if there are certain conditions under which MPG may have a positive effect. For example, do the degree and timing of elevated BHB concentrations, cow age, BCS at calving and loss post-calving affect this response?

Acknowledgements: *This study is part of a larger programme on improving cow fertility and lifetime productivity, which is funded by NZ dairy farmers through DairyNZ Inc. and by the Ministry of Business, Innovation and Employment. We gratefully acknowledge the support and dedicated contributions of the farm staff, technicians and veterinarians who worked tirelessly at the 3 farms (LUDF, Scott, TARS) enrolled in this study.*

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LUDF Update – Profitability and Productivity

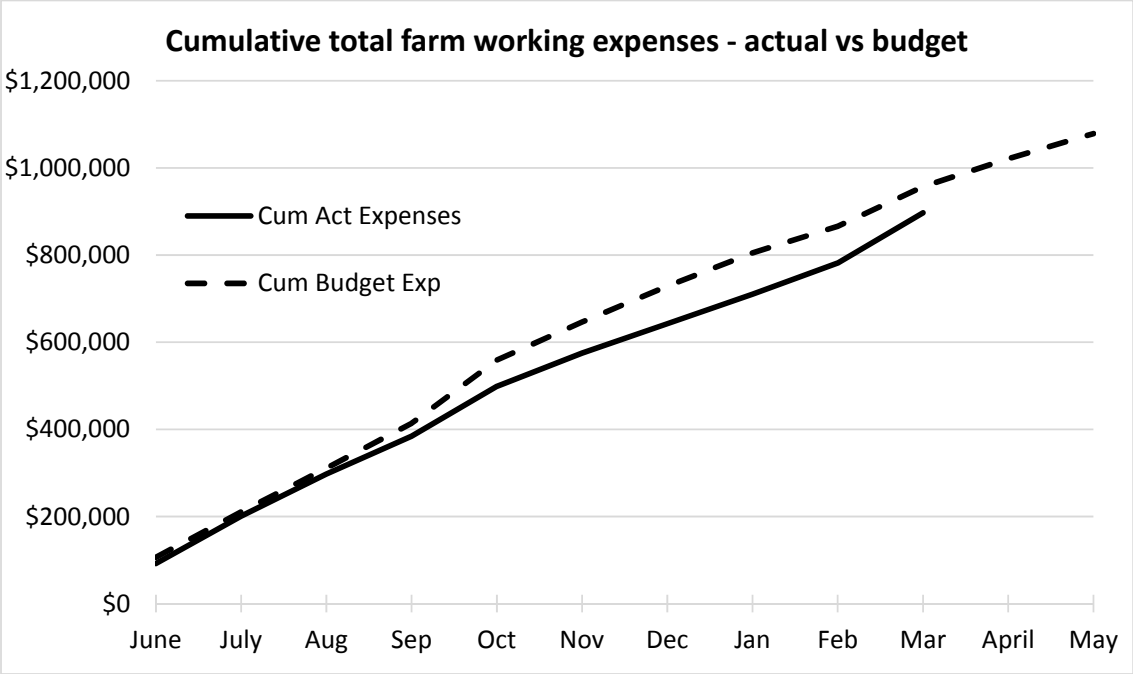
Results to date (to the end of April):

	2012/13	2013/14	2014/15	2015/16	2016/17
Total kgMS sold	285,707 kgMS	270,423 kgMS	261,570 kgMS	274,970 kgMS	269,011 kgMS
Total Cows in Milk	549	472	466	520	530
Tot N fert applied - kgN/ha	351 kgN/ha	250 kgN/ha	143 kgN/ha	179 kgN/ha	173 kgN/ha
Tot Purchased Silage Fed - kgDM/cow	373 kgDM/cow	507 kgDM/cow	255 kgDM/cow	114 kgDM/cow	307 kgDM/cow
Tot Purchased Silage Fed – tDM	235 tDM	319 tDM	143 tDM	63 tDM	171 tDM
Whole Herd liveweight (kg)	501 kg	497 kg	512 kg	500 kg	507 kg
Herd Ave CS	4.3	4	4.3	4.3	4.3
Silage made on farm (tonnes DM)	59	0	22	154	58
Silage made on farm (kgDM/cow)	93	0	40	275	104

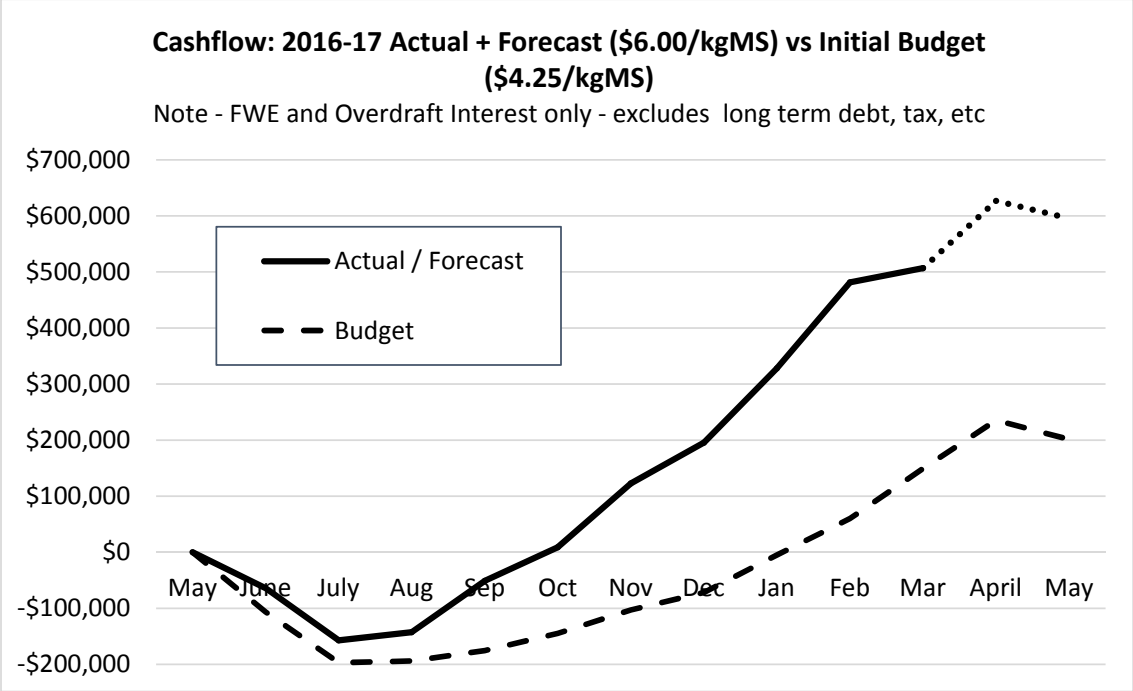
Sensitivity to Production:

Total Milk Production	**275,000**	**280,000**	**285,000**
Budgeted Total Expenses	$1,078,912	$1,078,912	$1,078,912
Ave Milk Production /cow	495	504	513
Expenses $/kgMS	$3.92	$3.85	$3.79

2016-17 Production Year:



See details below on expenditure to date.



Notes: The cash flow above assumes a zero balance as the start of the production year, overdraft interest rate of 7% but no interest / payments associated with term debt. 2015/16 retro payments ($145,000), and dividend payments (assuming 280,000 shares) are included.

Actual vs Budget Income and Expenses to date (and Forecast Year End)

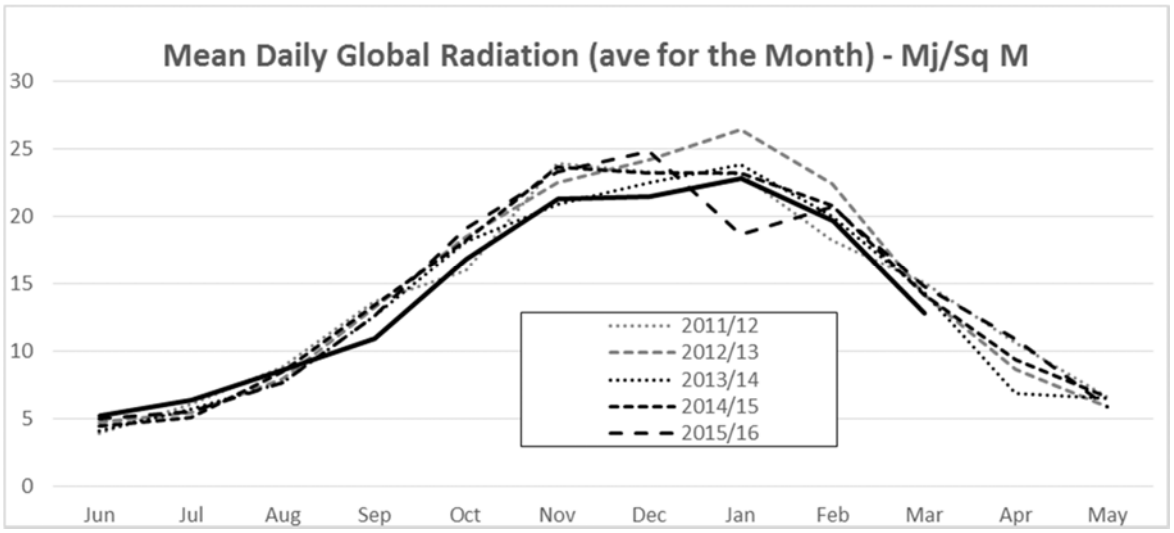
Year ending May 31		2015/16 Actual	2016/17 Budget	Actual to end March	Forecast Year End		Notes
Milk production (kgMS)		289906	280,000	243,635	282,763	101%	1
160ha		1,812 kgMS/ha	1750 kgMS/ha	1523 kgMS/ha	1767 kgMS/ha		
Peak Cow Nos and Prod.		555	560	556	556	99%	
Staff		3.70	3.7	3.7	3.7		
Income	Payout $/kgMS	$3.90	$4.25	$6.00	$6.00/kgMS		2
	Dividend /share	$0.40	$0.40/share	$0.20/share	$0.20/share		
	Milksolid Revenue	$1,130,633	$1,190,000	$1,461,810	$1,696,578		3
	Dividend	$115,962	$112,000	$48,727	$113,105		4
	Surplus dairy stock	129243	$112,959	$63,690	$119,740	106%	5
DairyNZ Levy		-$10,437	-$10,080	-$8,771	-$10,179		
Stock Purchases		-84960	-24,000	-33,900	-33,900		6
Gross Farm Revenue		**$1,280,442**	**$1,380,879**	**$1,531,556**	**$1,885,344**		
Expenses							
Cow Costs	Animal Health	$57,851	$53,562	$56,263	$69,068	129%	7
	Breeding Expenses	$42,230	$42,881	$41,552	$44,579	104%	
	Replacement grazing & meal	$135,151	$149,091	$115,345	$144,264	97%	
	Winter grazing - incl. freight	$195,655	$149,952	$142,766	$151,346	101%	
Feed	Purch FB + Grass sil.	$24,668	$62,160	$35,566	$86,896	140%	8
	Silage making & del	$20,088	$18,240	$6,926	$6,926	38%	9
	Giberillic Acid	$234	$13,120		0	0%	10
	Nitrogen	$45,093	$45,485	$38,364	$40,500	89%	11
	Fertiliser & Lime	$14,853	$26,255	$32,343	$32,343	123%	12
	Irrigation - All Costs	$76,030	$64,600	$81,505	$81,505	126%	13
	Re-grassing	$8,654	$20,215	$11,762	$11,762	58%	14
Staff	Employment	$228,413	$261,945	$194,991	$239,293	91%	15
Land	Electricity-farm	$25,379	$30,000	$23,278	$28,878	96%	
	Administration	$24,965	$24,700	$20,208	$24,066	97%	
	Rates & Insurance	$21,020	$21,020	$21,020	$21,020	100%	
	Repairs & Maintenance	$53,042	$54,000	$53,162	$67,472	125%	16
	Shed Exps excl. power	$9,119	$9,850	$7,108	$7,108	72%	17
	Vehicle Expenses	$22,989	$31,336	$14,789	$19,789	63%	18
	Weed & Pest	$1,174	$500	$820	$820	164%	
Cash Farm Work. Expenses		**$1,006,608**	**$1,078,912**	**$897,768**	**$1,077,635**	99%	19
FWE/kgMS		**$3.47**	**$3.85**		**$3.81**		
Depreciation est.		$116,000	$116,000		$116,000		
Total Operating Expenses		$1,122,608	$1,194,912	$897,768	$1,193,635		
Dairy Operating Profit		$157,834	$185,967		$691,709		
DOP/ha		**$987**	**$1,162**		**$4,323**		
Cash Operating Surplus		$273,834	$301,967		$807,709		
Cash Oper Surplus per ha		**$1,711**	**$1,887**		**$5048**		

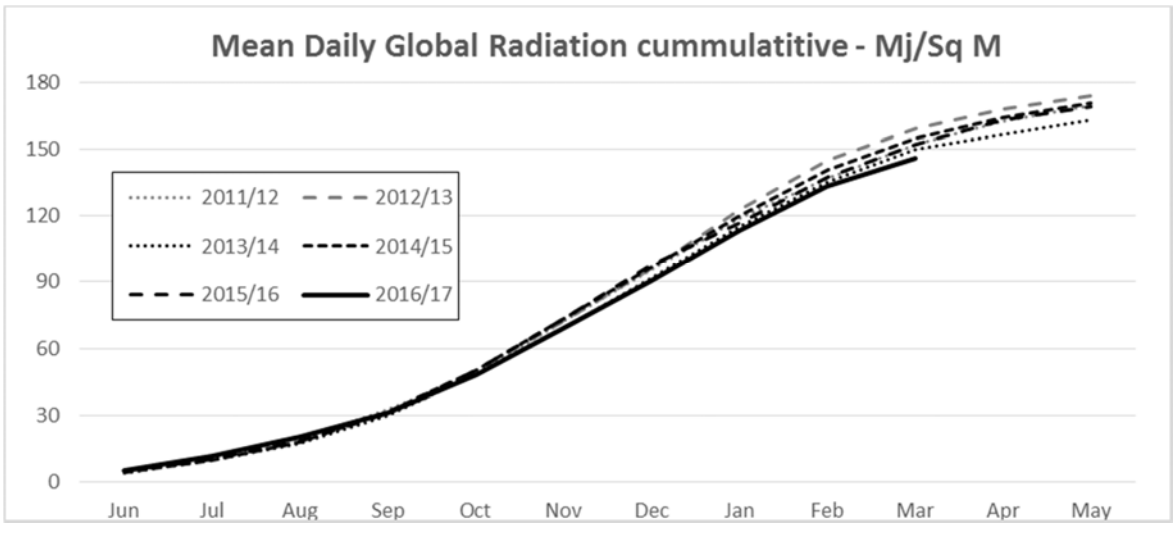
Notes to Actual vs Budget Expenses to the end of March – and Forecast Year End Expenses:

1. Milk production was 9.6% behind budget for March, and is 3.5% behind year to date, though on target to meet the year end budget. Budgeted milk production for May had been deliberately kept light.
2. Forecast milk pay-out is currently $6.00/kgMS compared to budget of $4.25/kgMS.
3. Milk income is thus up by $500,000 due to increased pay out.
4. Dividend income assumes a share is held for each kgMS supplied.
5. Actual stock income to the end of March is below budget to the end of March, as culls have been kept on farm longer this season than budgeted.
6. 6 Extra bulls purchased due to predicted low 6 week in calf rate and effect IBR may have had on AI mating.
7. Animal health is over budget by $7643 to the end of March, due to a combination of having IBR present in the herd which resulted in extra vet visits and subsequent IBR vaccines. Increased Lameness has also had an impact on expenses, as has increased spending on minerals, calving expenses and needing to use the vets to teat seal the R2 heifers (as they were away from the milking platform).
8. To the end of March the farm had only purchased 99 tonne of the budgeted 168 tonnes DM grass silage. Most of this additional silage has been purchased and fed in April, as has fodder beet which was not budgeted, resulting in the forecast year end increase in feed costs.
9. Less silage was made on the platform this season than budgeted - 57.8 tonne DM compared to 150 Tonne budgeted
10. No Giberillic Acid was used this season
11. Nitrogen fertiliser was cheaper than budgeted, the budgeted volume has been applied this season.
12. Additional Potassium was applied to non-effluent areas based on low soil test levels.
13. Higher maintenance costs than budgeted due to ongoing issues with our 16 year old north pivot
14. Had budgeted to re grass 2 paddocks. To date have only done one and not likely to do a second one this season but may incur some further cost this autumn if we over sow some of our shogun paddocks.
15. Employment costs continue to run lower than budgeted due to not employing 4th staff member till mid-July and being one staff member down for most of January.
16. Over expenditure of $10,472 in R&M has been generated by over spending in most areas of R&M: - some of the bigger items include a Fan replacement on the refrigeration unit - $1867; vat wash motor $1206; security lights $3115; service cup removers $7389; and mower repair $7300. A small portion of this has been off set with $9000 budgeted for Tracks not spent yet.
17. Savings in shed expenses are due to timing of budgeting.
18. Vehicle expenses are well below budget due to the purchase of new Bikes at the beginning of this season. Have also had less costs with the ute and tractor.
19. Have managed to operate the farm under budget so far this season but some of the $59,493 saving in the budget compared to actual at the end of March has been spent in April or will be required in May.

LUDF Season-to-date update

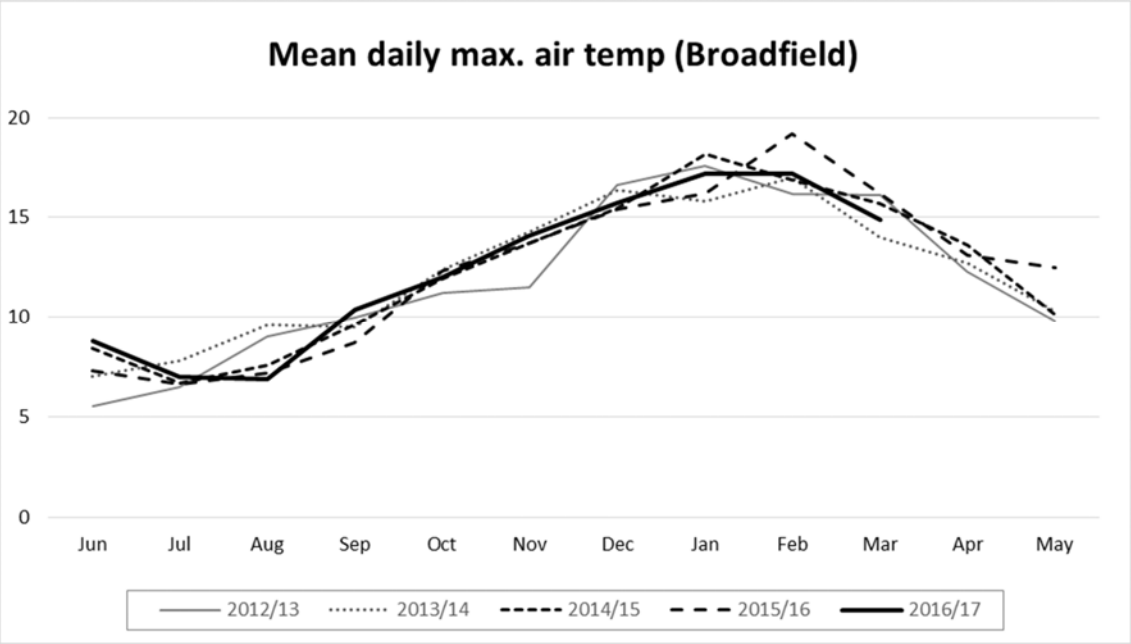
Sunshine, Temperature, rainfall and irrigation



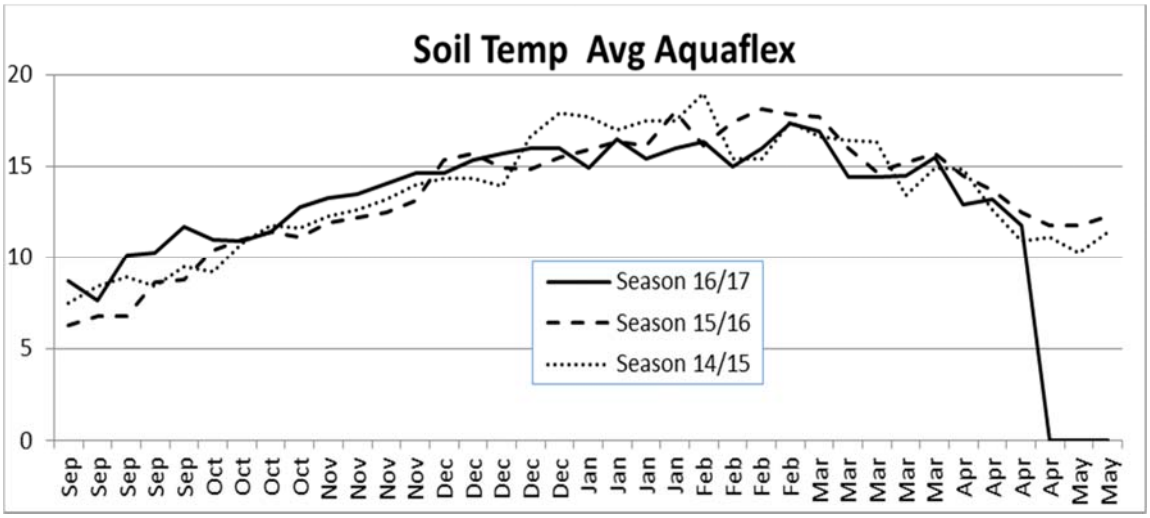


The above graphs effectively show the level of sunshine received during the season. While June – August was a little sunnier than previous seasons, most months since then have recorded less sunshine than any of the preceding 5 years. This is likely to have affected pasture growth and quality.

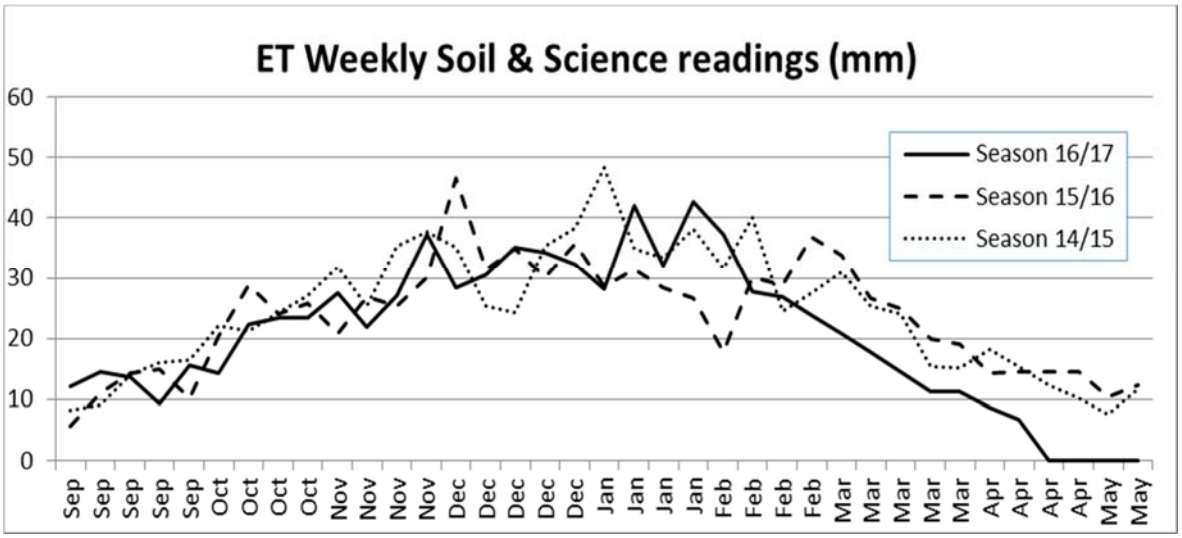
Air temperature, below shows a milder June and September but a cooler August and only average temperatures through the summer months this season.



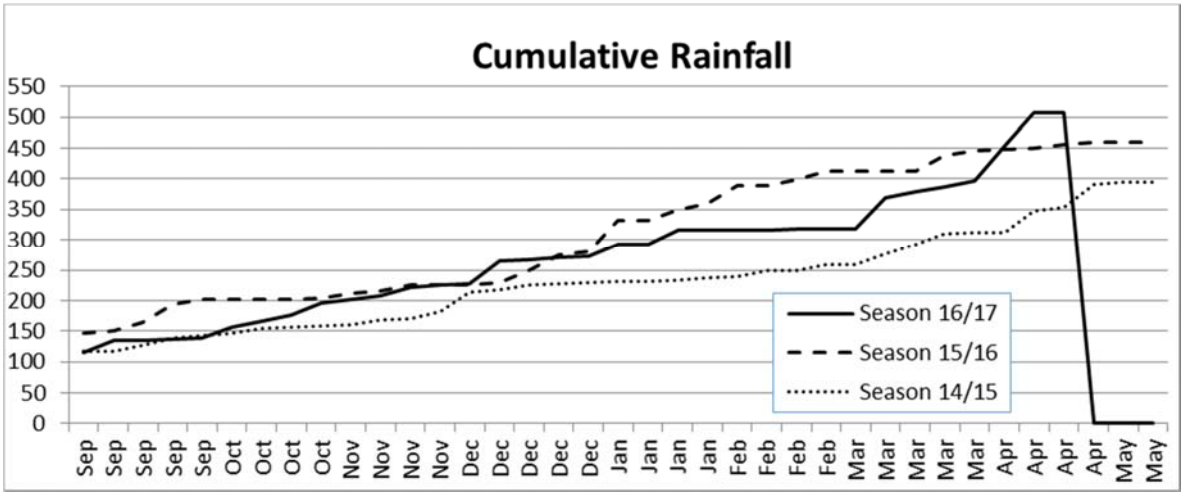
Soil temperatures can be seen to follow a similar pattern as air temperatures, holding above previous seasons for most of the first part of the September to November period, then dropping below previous years levels through the summer and autumn periods.



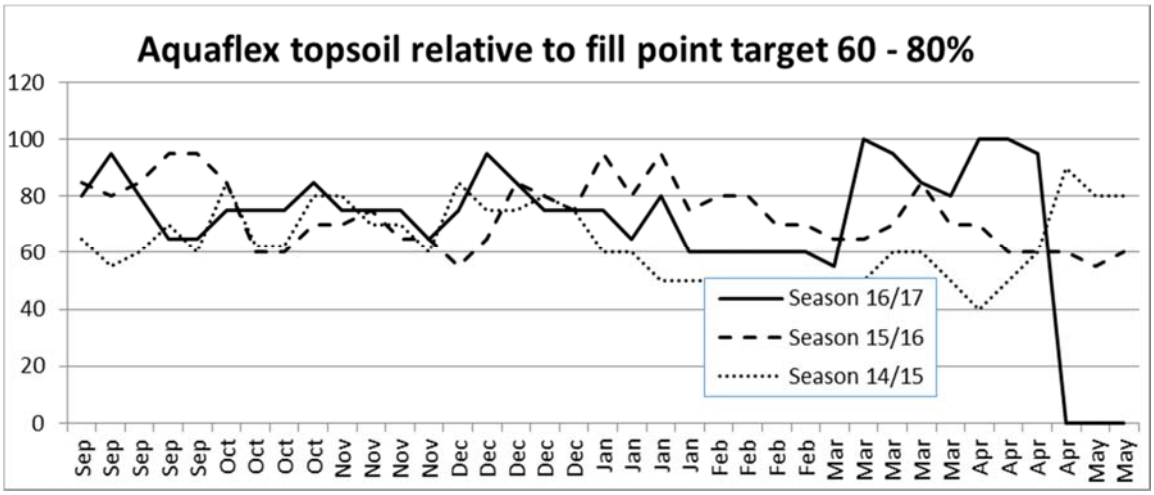
Evapotranspiration rates for the September – December period reflect the lower radiation levels, and relatively average air and soil temperatures compared to recent years. A couple of spikes of high ET in January resulted in more ET losses than the farm could replace through irrigation, but this reversed in February when ET began a steady decline.

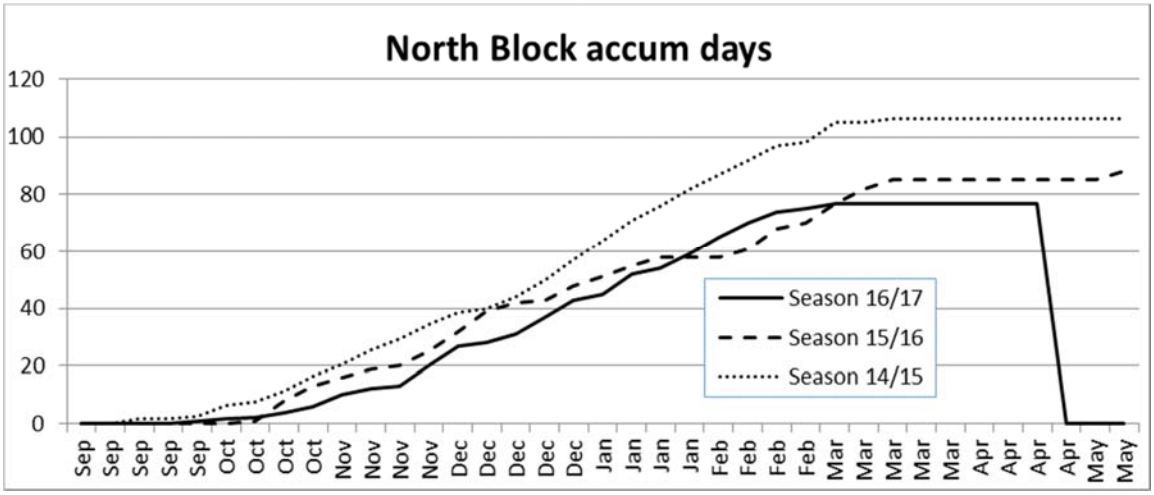


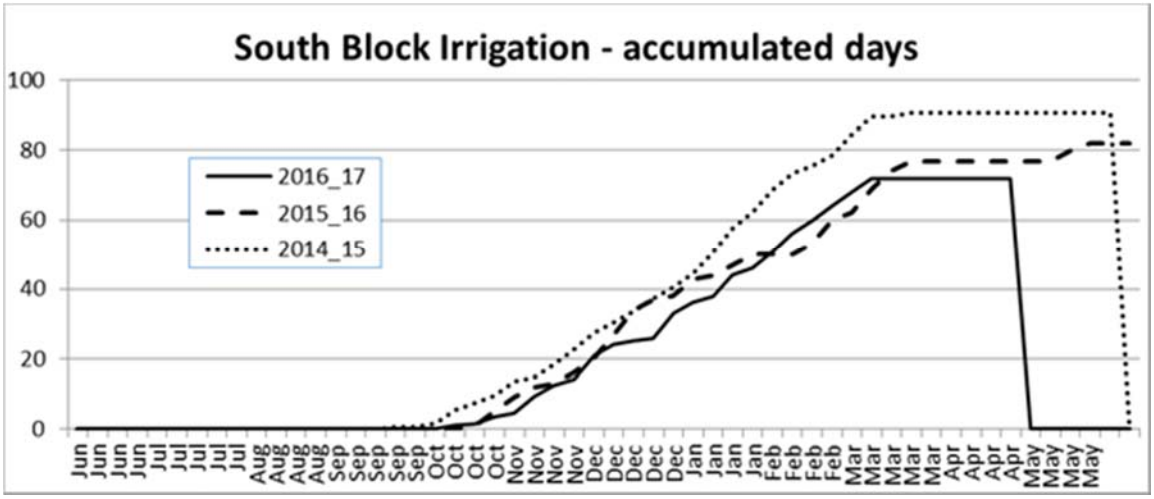
Rainfall events till early March this season appeared to be spread a bit more evenly through the year including some rain falling at critical times of the early season when the farm was attempting to regrass a wetter area of the farm and make surplus pasture silage. January and February were particularly dry months with high ET (as above). Since mid March over 200 mm of rain has fallen, contributing welcome rain to the local lowland streams and enabling savings in irrigation but has made autumn management a challenge with high levels of lameness and feeding challenges (see animal health graphs and fodder beet feeding section below).



Generally the farm was able to keep the soil water level between 80% and 60% with only a small period in late February when soil moisture levels were dropping below normal comfort levels. This was also impacted on the North block with a number of days where the Nth Pivot was not operational due to a series of breakdowns.





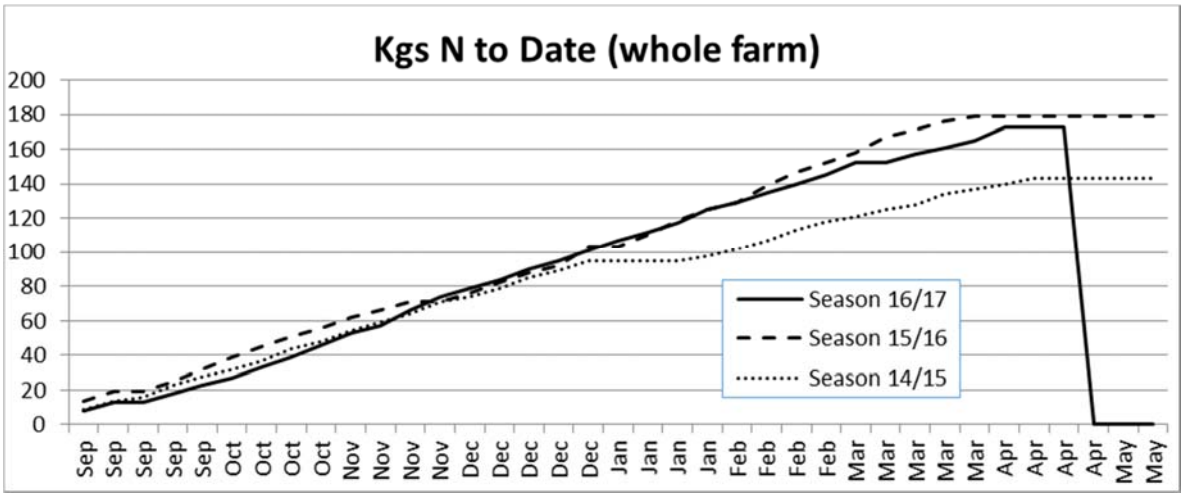


Pasture Performance

Planned Nitrogen fertiliser use was application rates of 25kgN/ha on non-effluent areas of the farm only.

Applications occurred as soon as practical following grazing, from late August till early April with an average total application of 173kgN/ha across the whole farm.

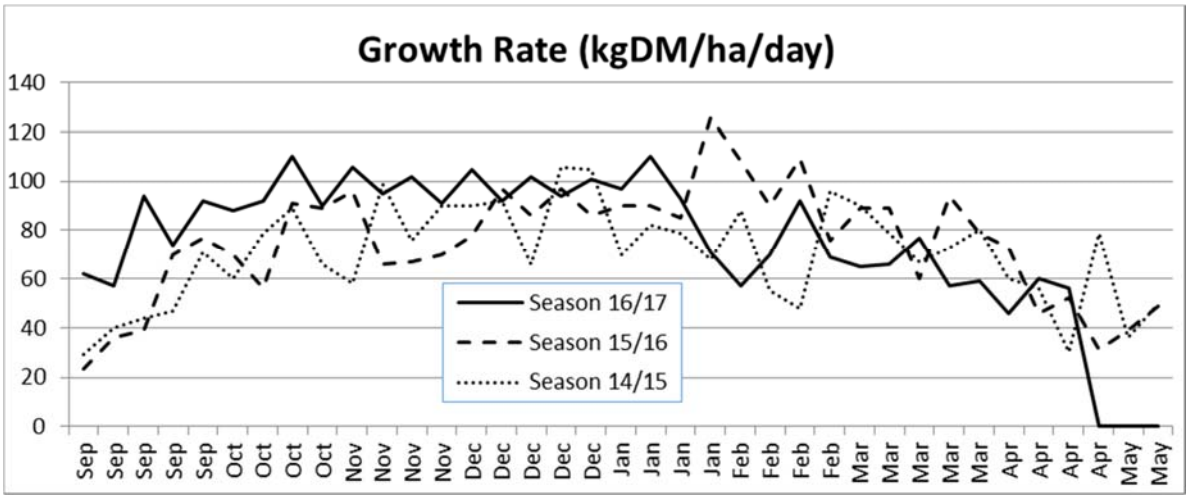
The slightly faster rotation used for about 3 weeks in late October/early November saw the use of N climb above last season's level through that period. When applying N following the cows, round length can have a major impact on the total amount of fertiliser applied.

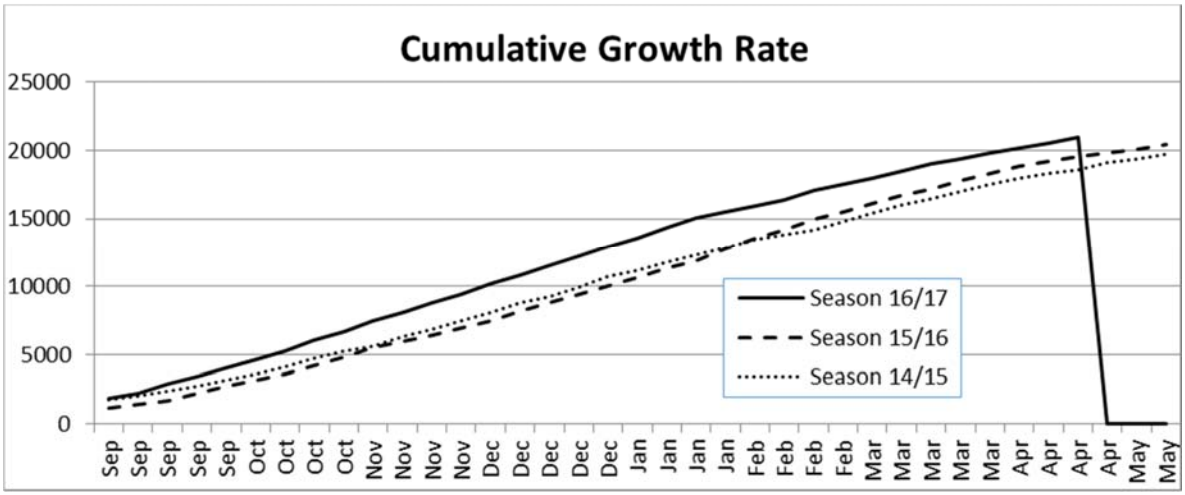


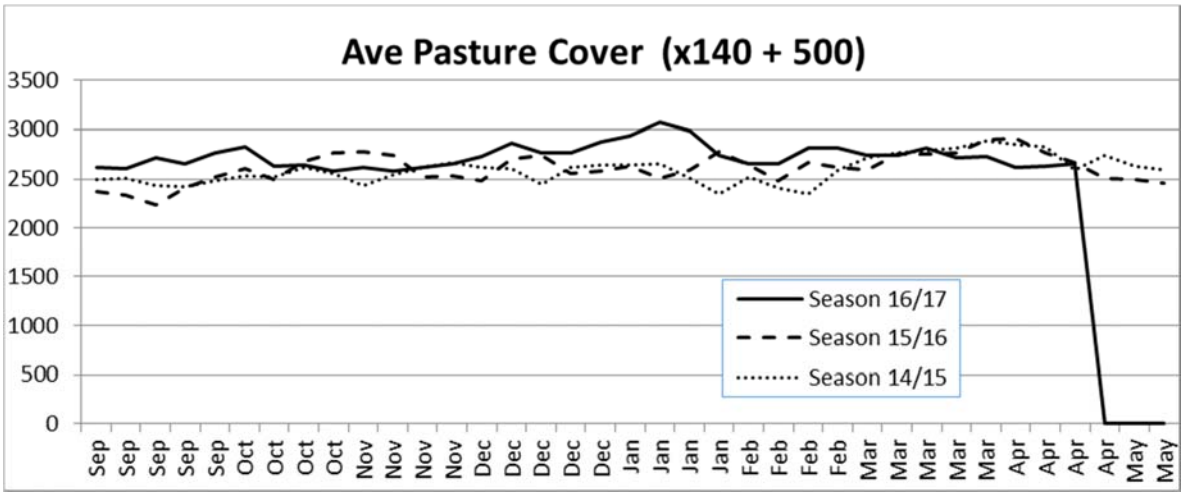
Pasture Growth

Pasture growth rates and average pasture cover (APC) are critical components of the low input farm system operating at LUDF, yet accurate estimates of pasture growth rates and APC remain challenging to obtain. A weekly farm walk has historically provided this data, by means of comparing average pasture cover in a paddock compared to the previous week. Theoretically this provides a useful estimate but increasingly the data derived by this means has not matched corresponding data in terms of apparent pasture intake.

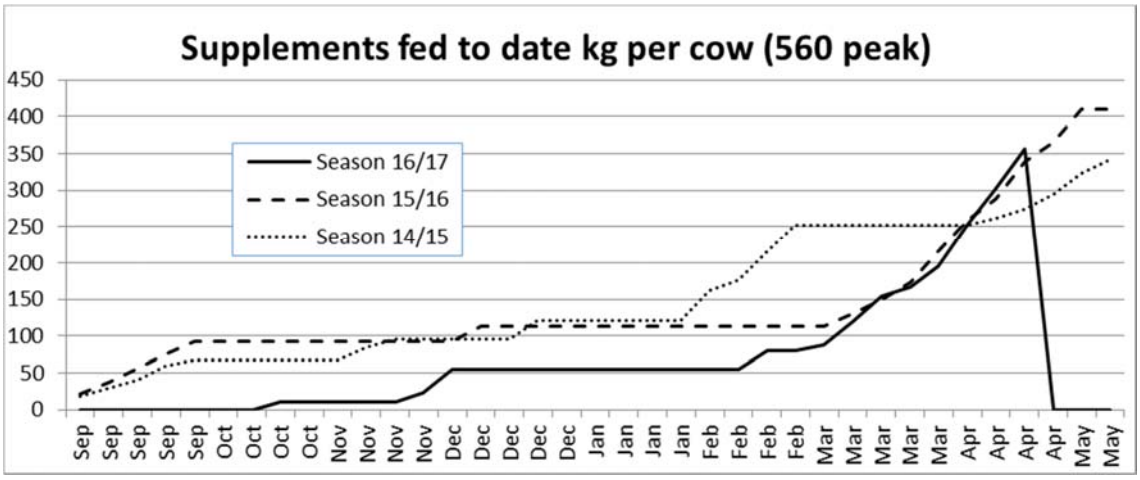
Caution is therefore required when interpreting the following graphs and comparisons with past seasons, as the data reported is based on the theoretical growth rate achieved, not a derived pasture growth rate considering intake.







Average pasture cover started higher than previous seasons after the favourable winter then dropped through the October/November period when the farm ran a shorter round, as well as having harvested about 2 paddocks for silage in a short period of time and having taken out paddock S5 for regrassing.



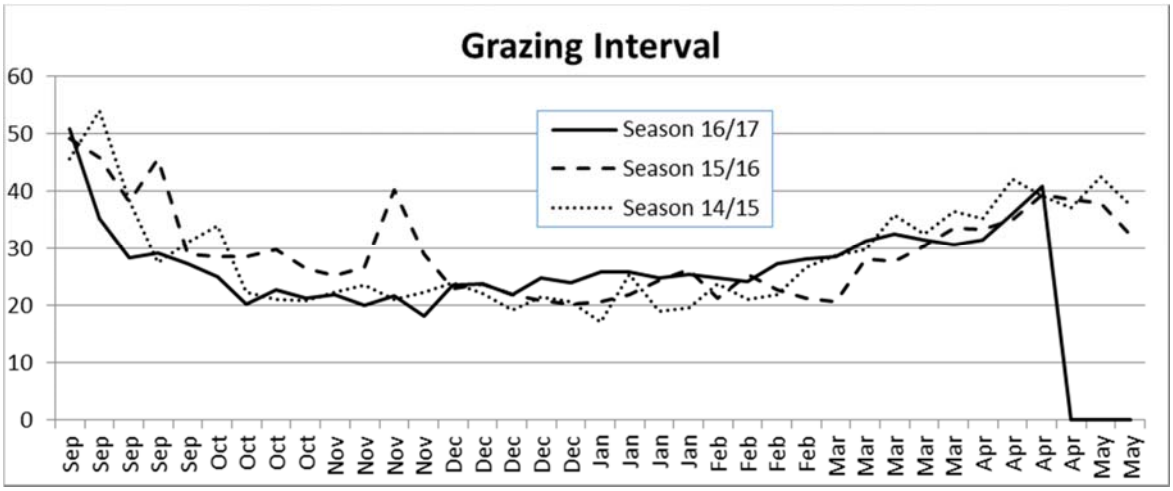
The milder early winter, target APC at calving and focus on holding to the long first grazing round (spring rotation plan) enabled the farm go through calving without the need to feed supplements but without restricting cow intake.

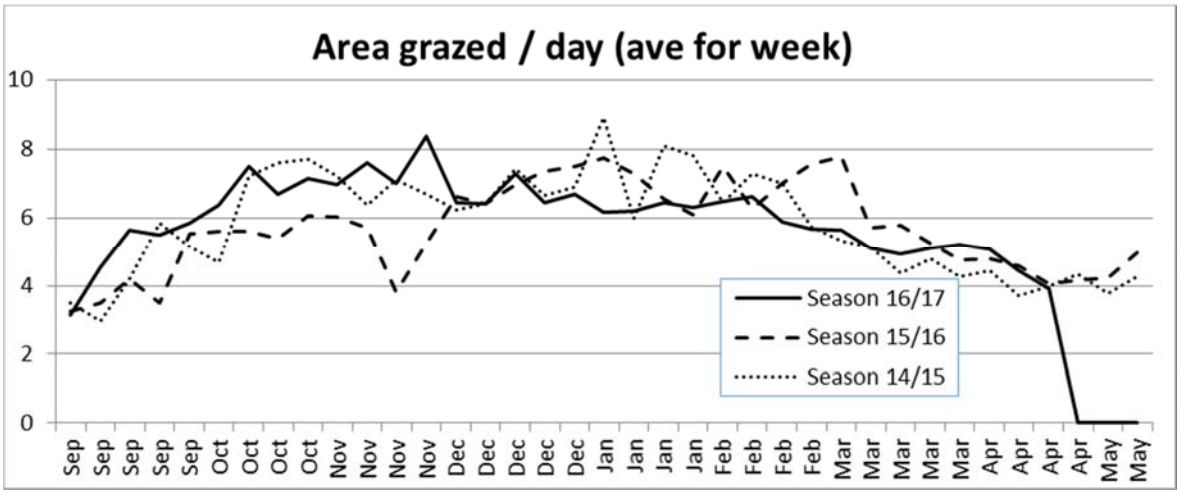
LUDF ran an average 21 day rotation length from mid October till the end of November, and while theoretical growth rates above suggest pasture growth exceeded demand, in practice this was not observed in average pasture cover. 43 kgDM/cow was added as supplement over two weeks in late November / early December to lift the round length to average 24 days through December.

Round length remained stable at around 25 days through the rest of the summer with some supplements required in February to keep this up.

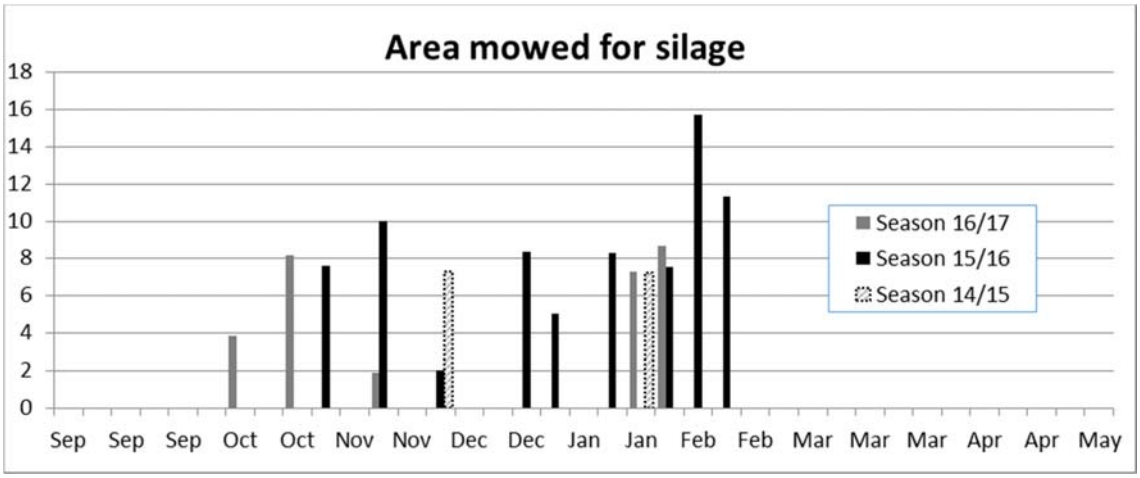
From end-February onwards, as growth rates dropped below previous season's levels, supplements were required to keep the round length going.

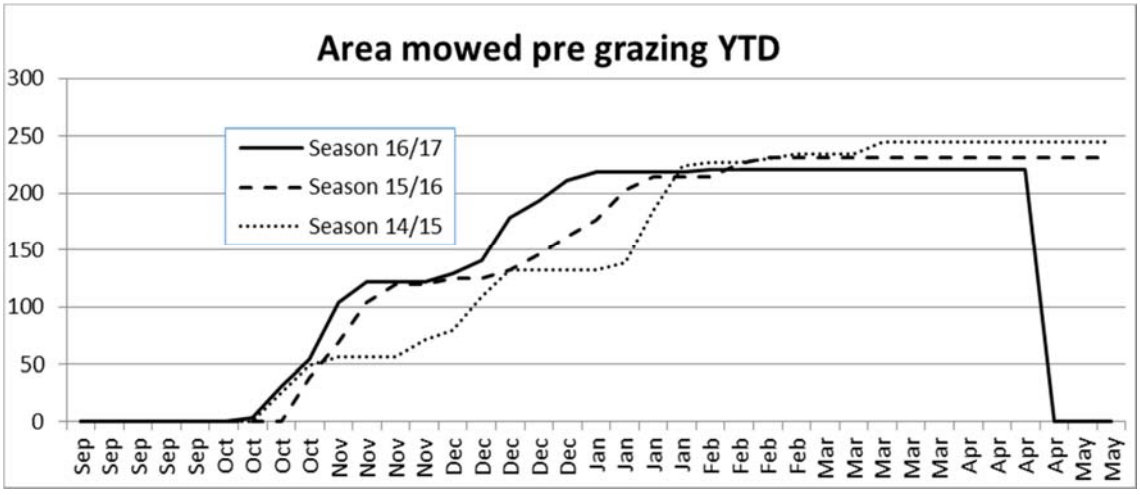
Lifted fodder beet was started late March to introduce the herd to this feed.

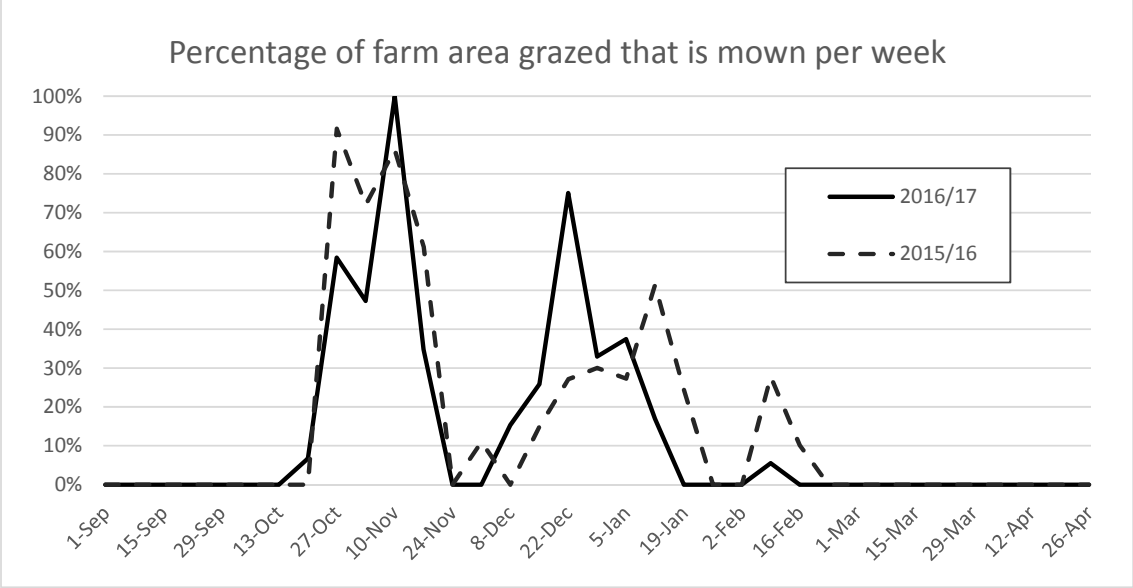


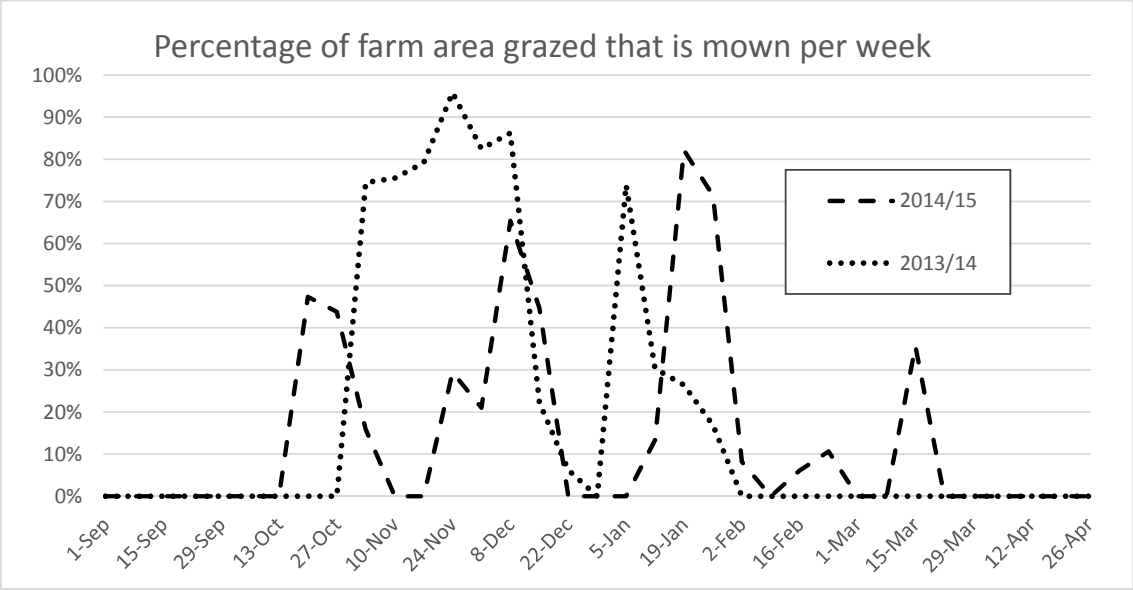


As has occurred in past seasons, the use of silage and or pre-graze mowing was used as needed to manage pasture surpluses and achieve target grazing residuals (and thus pasture quality) in a timely manner. This season, occasional rain events through the spring restricted the use of pregraze mowing and delayed the harvesting of some silage, hence some post-graze mowing also occurred. In total, a similar area was mown this season.







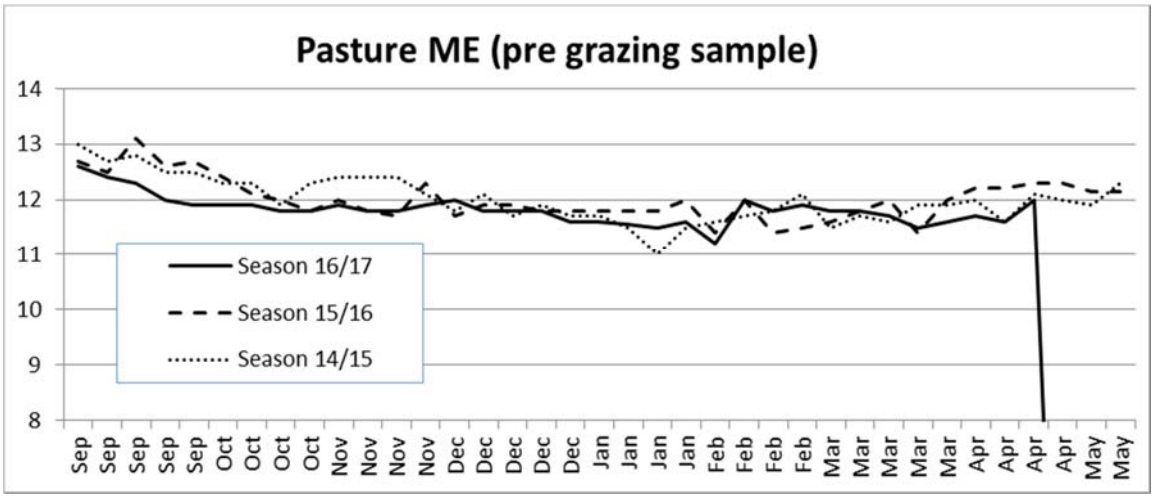


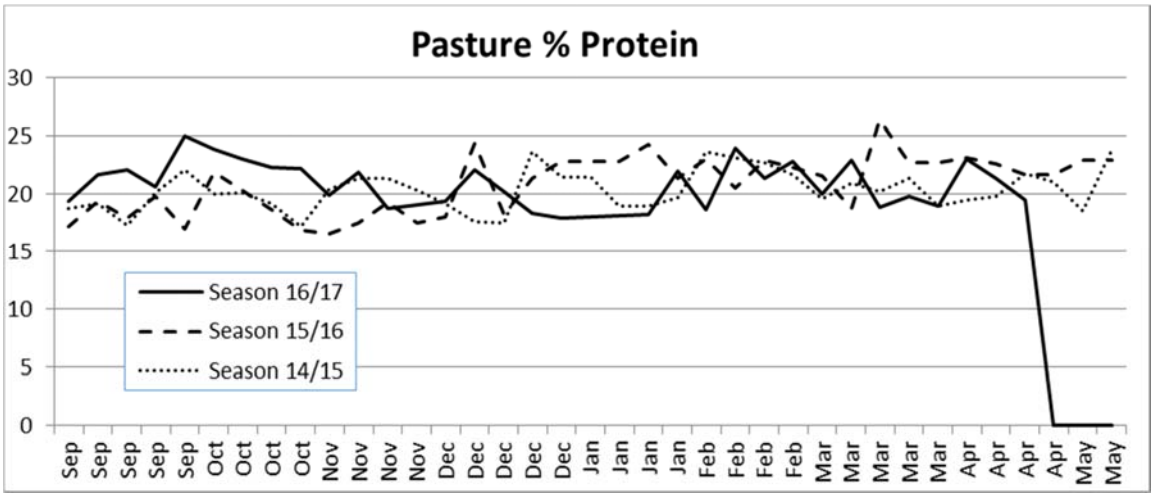
Pasture Quality

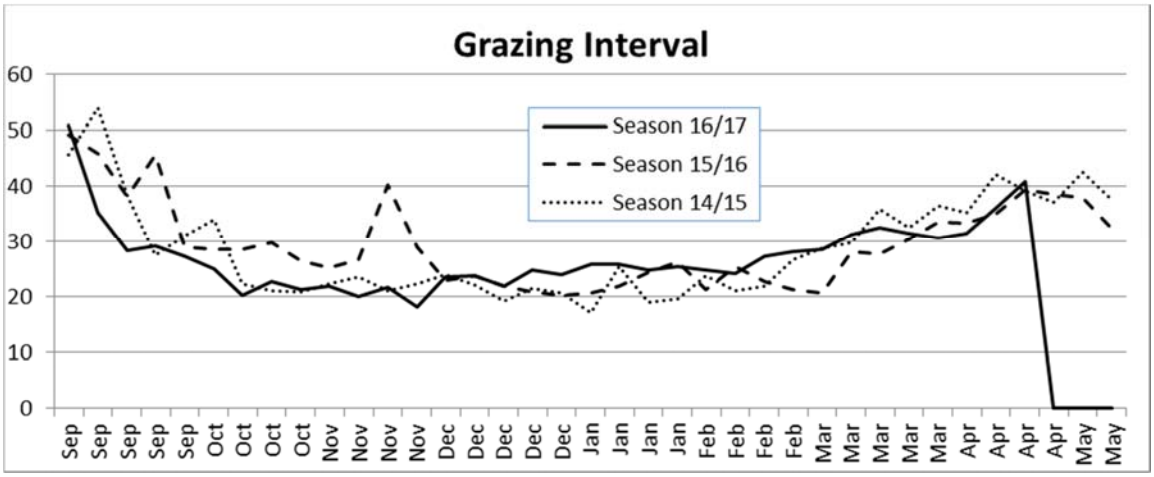
On average, pasture ME has tended to be lower this season than past years, protein content was higher during the shorter grazing round in October, then lower during most of December and January (when the grazing was longer) before lifting again in February.

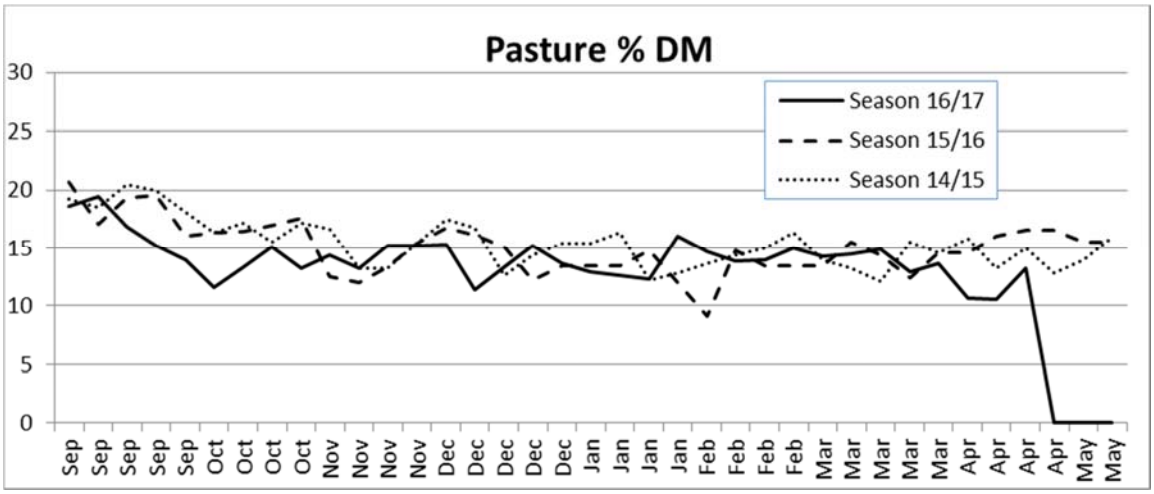
DM% have generally been lower this season, with particularly low levels noted in early April. NDF has by comparison generally been higher this season.

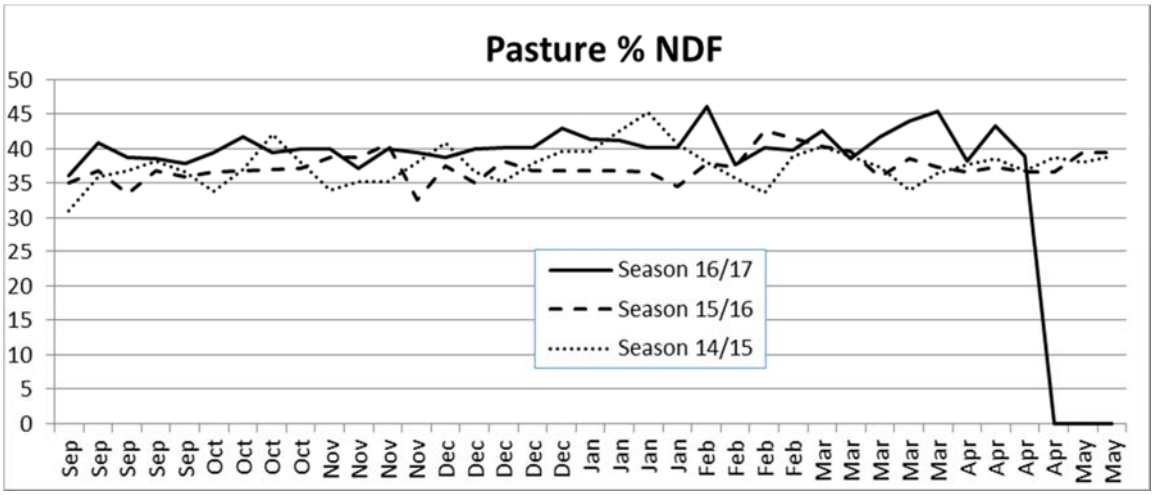
The combination of lower pasture DM%, lower ME, and higher NDF are unlikely to have helped intake or production.


Pasture ME (pre grazing sample)
14
13
12
11
10
9
8
Season 16/17
Season 15/16
Season 14/15
Sep Sep Sep Sep Sep Oct Oct Oct Oct Nov Nov Nov Nov Dec Dec Dec Dec Dec Jan Jan Jan Jan Feb Feb Feb Feb Mar Mar Mar Mar Mar Apr Apr Apr Apr May May


Pasture % Protein
30
25
20
15
10
5
0
Season 16/17
Season 15/16
Season 14/15
Sep Sep Sep Sep Sep Oct Oct Oct Oct Nov Nov Nov Nov Dec Dec Dec Dec Dec Jan Jan Jan Jan Feb Feb Feb Feb Mar Mar Mar Mar Mar Apr Apr Apr Apr May May

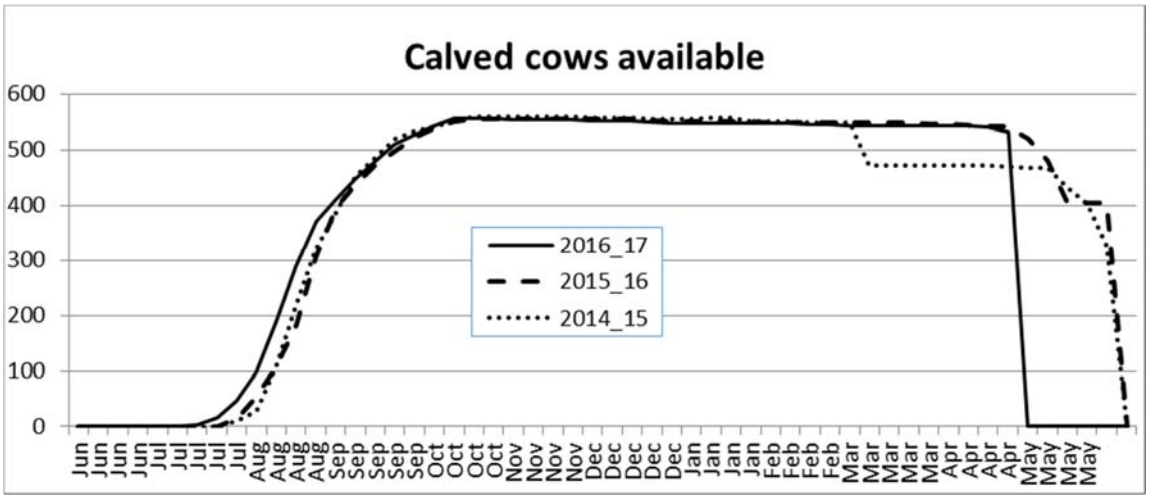

Grazing Interval
60
50
40
30
20
10
0
Season 16/17
Season 15/16
Season 14/15
Sep Sep Sep Sep Sep Oct Oct Oct Oct Nov Nov Nov Nov Dec Dec Dec Dec Dec Jan Jan Jan Jan Feb Feb Feb Feb Mar Mar Mar Mar Mar Apr Apr Apr Apr May May



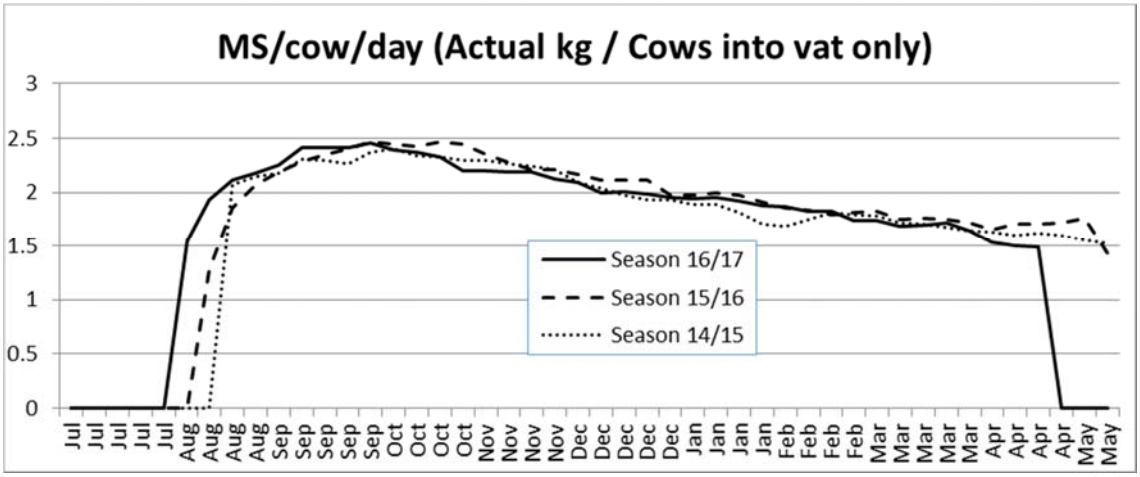


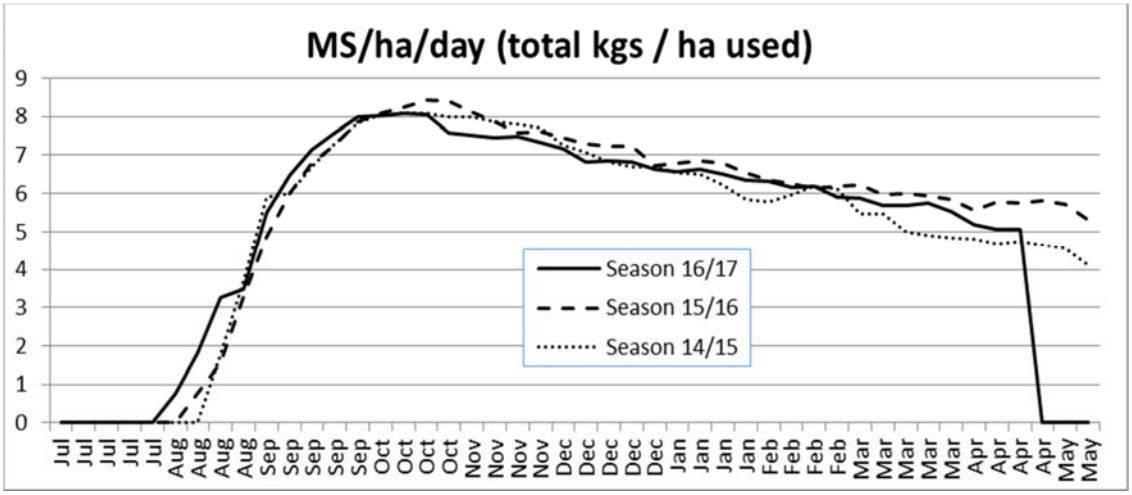
Herd and cow performance

Early calving of the R2 heifers and a higher number of R2ys this season (25% compared to 22% last season) contributed to the higher number of calved cows in August, however calving rate then slowed for the latter part of calving. Slightly higher winter / early season losses prevented the farm achieving its target of peak milking 560 cows, however minimal losses since then have enabled the farm to still have 541 cows in milk at the end of April. Peak cows milked this season was 555.



The higher number of heifers in the herd, along with the weather and pasture quality noted above challenged the farms ability to peak at the levels seen in past years – both per hectare and per cow. Last year the farm maintained a long peak whereas this season the dropoff was quicker so that average production per month (other than August) has been 1-3% behind last season).





Herd BCS and health

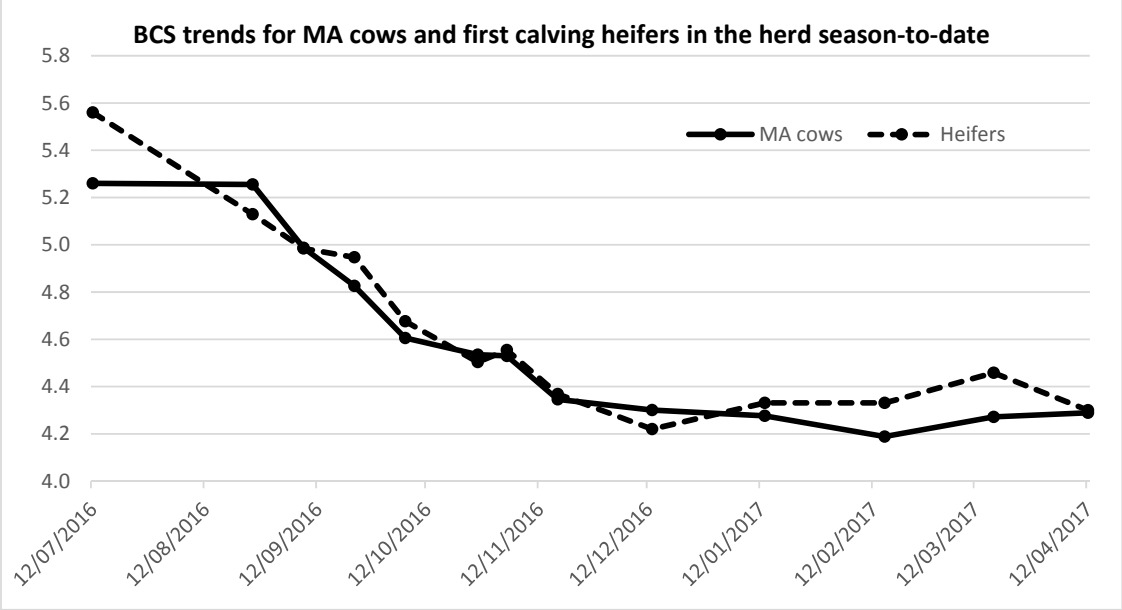
In terms of cow condition, it the BCS advantage of the first calving heifers (compared to the MA cows) was lost very early in the season. Through December to March, first calving heifers gained more BCS compared to their older peers. First calving heifers remained at the same BCS level as MA cows through the whole season except during early September and mid-December when as a group they fell below the MA cows.

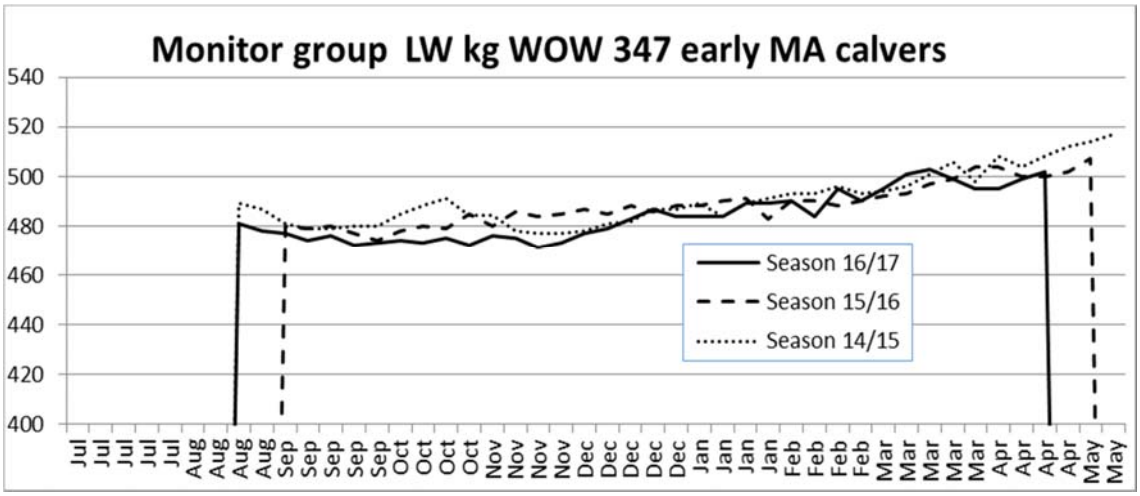
It is important to remember that the first calving heifers suffered from an IBR infection with symptoms starting in late September and a peak of respiratory problems seen in mid-October early-November, coinciding with the start of mating. First calving heifers lost a lot of BCS and weight through this period.

As a whole herd, the cows have been at their lowest live weight over the last 3 seasons. It is important to remember that the monitor group evaluated for LW through the season does include heifers and MA cows, so the LW graph will show the effect of the IBR outbreak going through the young herd. Additionally the higher number of heifers on farm is likely to have resulted in more heifers in this group of cows than past years.

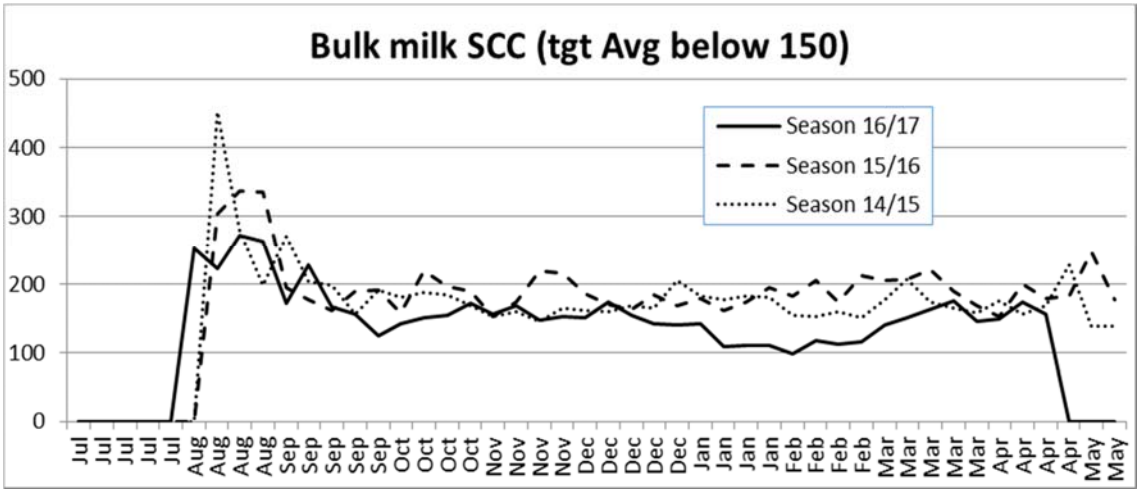
Other factors that are likely to have also contributed to the liveweight results are:

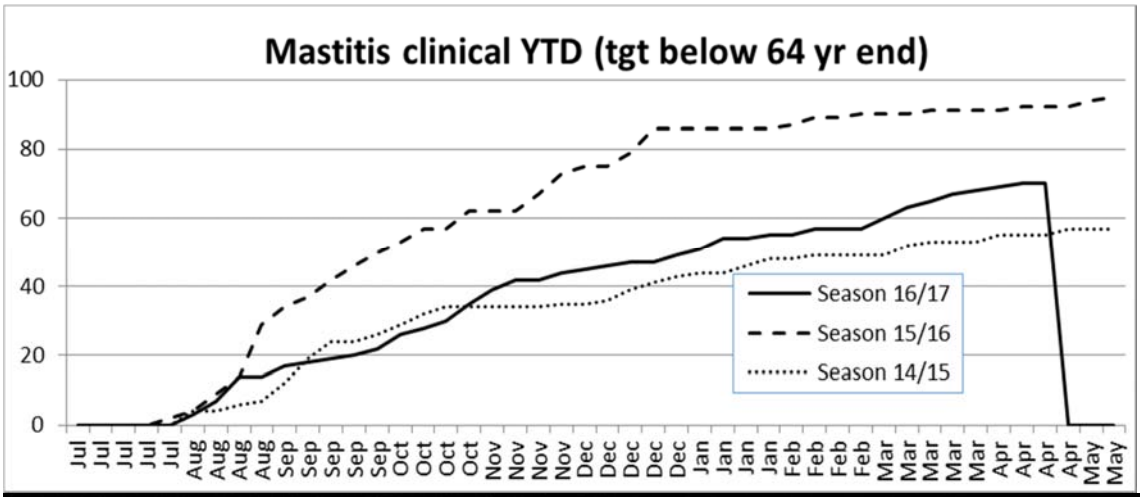
1) The variable pasture quality: low DM%, high NDF% and lower than desired ME content, contributing to more difficulty feeding cows there desired daily energy intake.
2) IBR infection problem that went through the herd
3) The faster round in October/November that was not really supported by growth rates and subsequent challenge of managing pasture whereby the weekly data on growth rates collected with the platemeter did not match observations of apparent intake and cow behaviour.





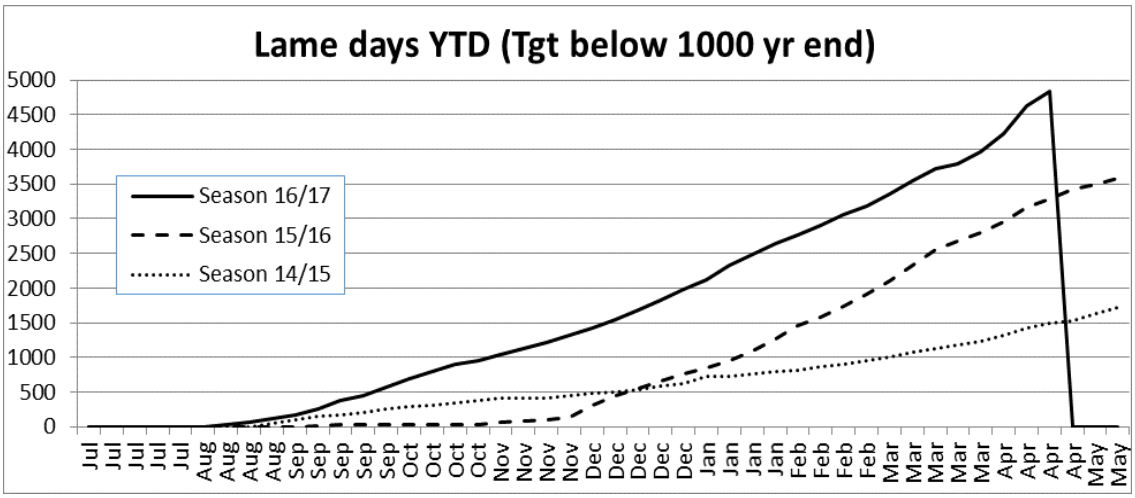
In terms of BMSCC and clinical mastitis cases, last season's issues seem to have been resolved with the changes done to the vacuum levels and teat spray used. It is pleasing to see that even when the respiratory disease was going through the young herd, the good management and stockmanship practices inside the shed meant that the lesser health condition of the young herd did not translate also in a peak of clinical mastitis.



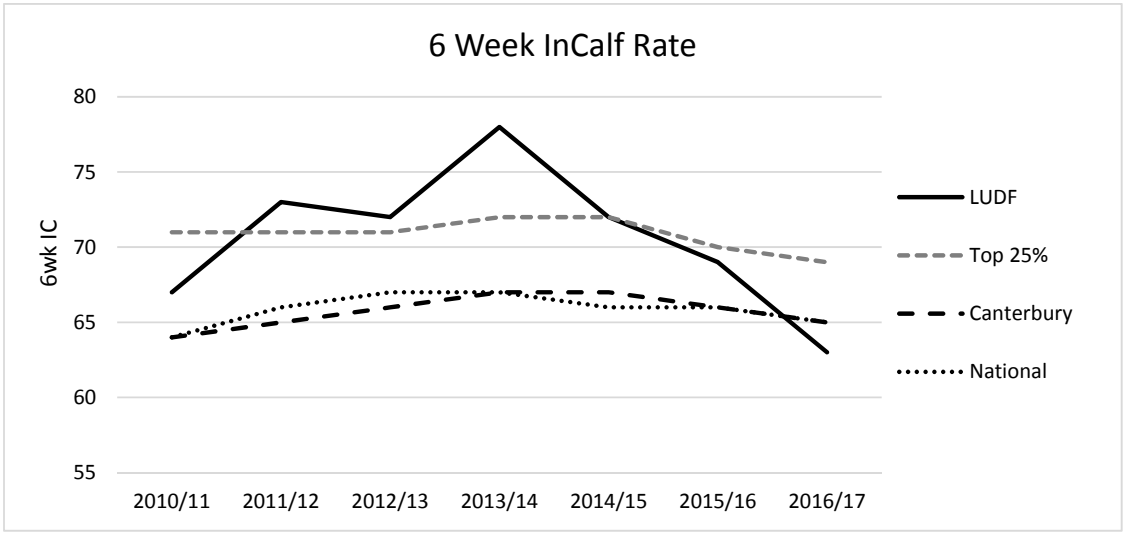


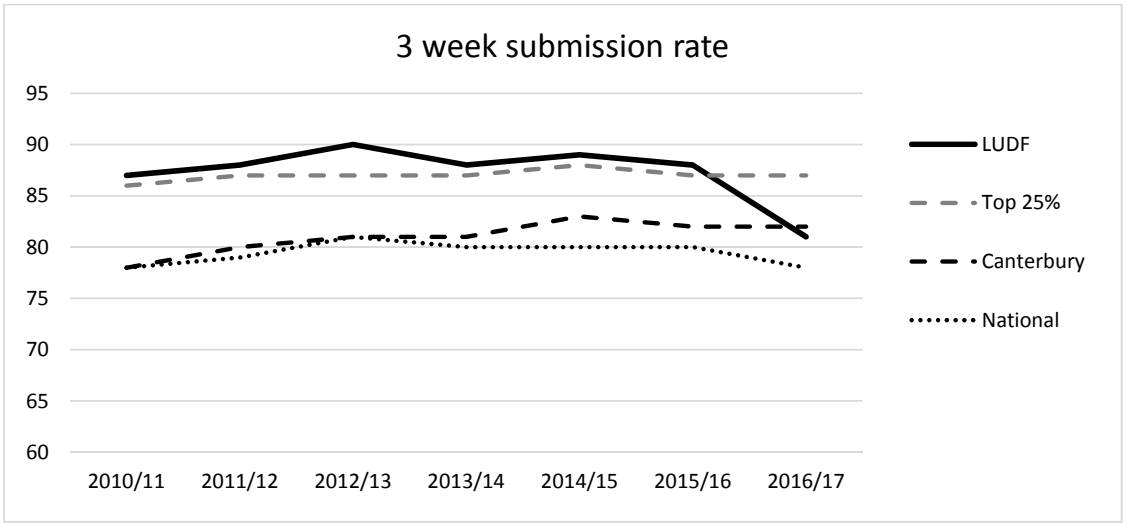
Lameness, on the other hand, has been an issue through the whole season. It started very early and has remained high.

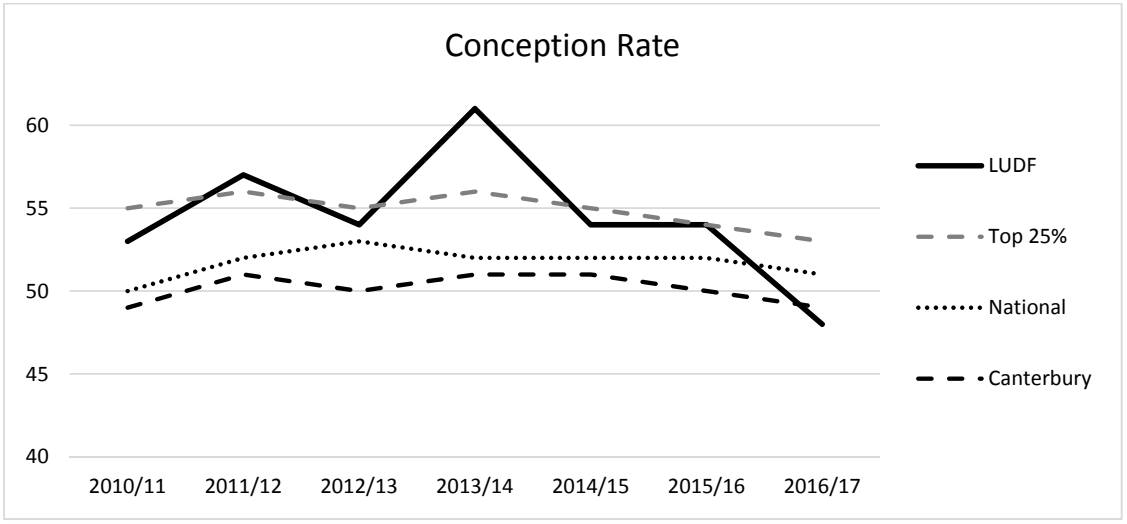
Preventive hoof trimming was initiated around November with a professional hood trimmer coming monthly to treat cows and train the whole team at LUDF to treat lameness as soon it is identified.



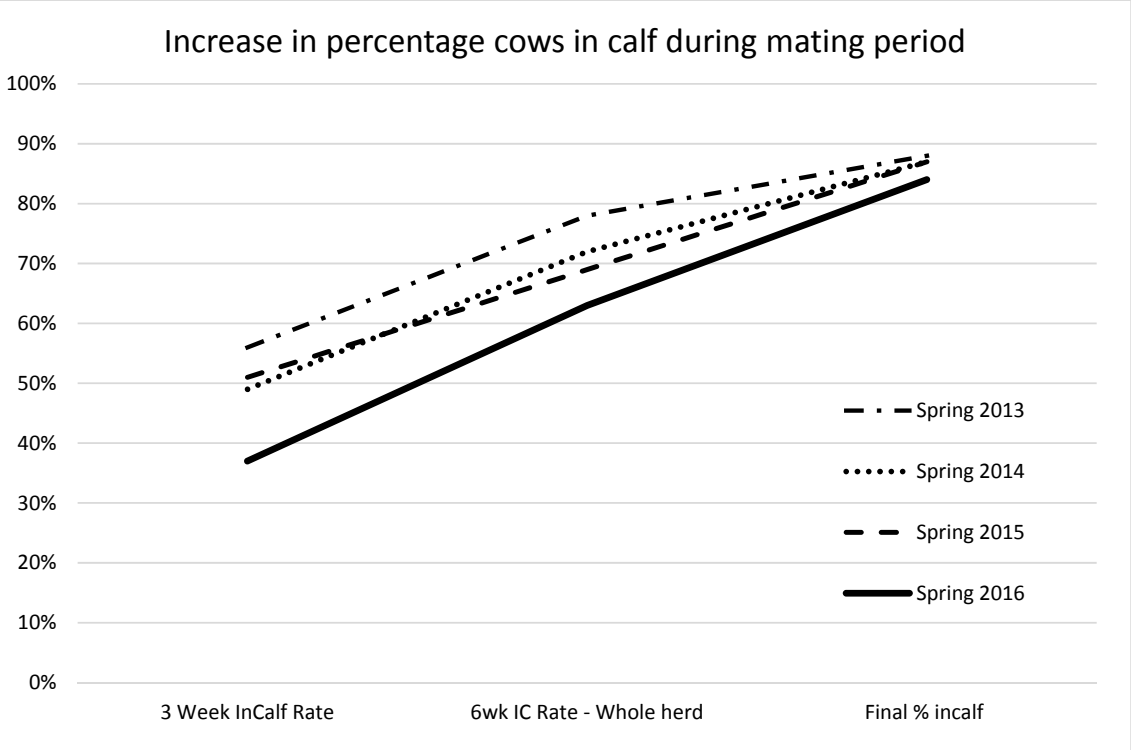
Review: InCalf Results – National and Regional Data







LUDF – reproduction performance during Spring 2016:



Reproductive performance at LUDF at the end of the first 3 weeks was 14% below last year, this reduced to 6% behind at the end of 6 weeks and only 3% behind past years performance at the end of mating.

Viewing the farms mating performance in this manner supports the probability that IBR (see February 2017 Focus Day handout) had a significant effect on early reproductive performance, AND that the continued focus on getting cows in calf, including additional bull power for the last 4.5 weeks of mating contributed to a reasonable final in-calf rate – certainly when compared to the early season performance.

1. Late lac:

- Johnes – follow up bloods
- Minerals Mg, trace ± DCP?
- Monitor livers (culls)
- Finalise FB use through dry off, how, what, when
- Dry off decisions, management of fats
- DCT consult

Feed testing (ASAP)

- Feed test/macros FB bulb & tops
- Feed test/macros milking platform pasture

2. Dry period

- Usage of Fodderbeet, pasture & / or silage
- Contingencies for high BCS mid winter
- Minerals. DCP. Mg. Trace.

Feed testing (Mid May)

- Feed test/macros FB bulb & tops
- Feed test/macros Silage (s)

3. Springer

- Diet balance confirm
- Mg etc (anionics?)

Feed testing (early July)

- Feed test/macros East Block pasture
- Feed test/macros Silage (s)

Blood testing (early August)

4. Colostrum

- Diet balance confirm
- Mg etc, Calcium/limeflour

Feed testing (mid July)

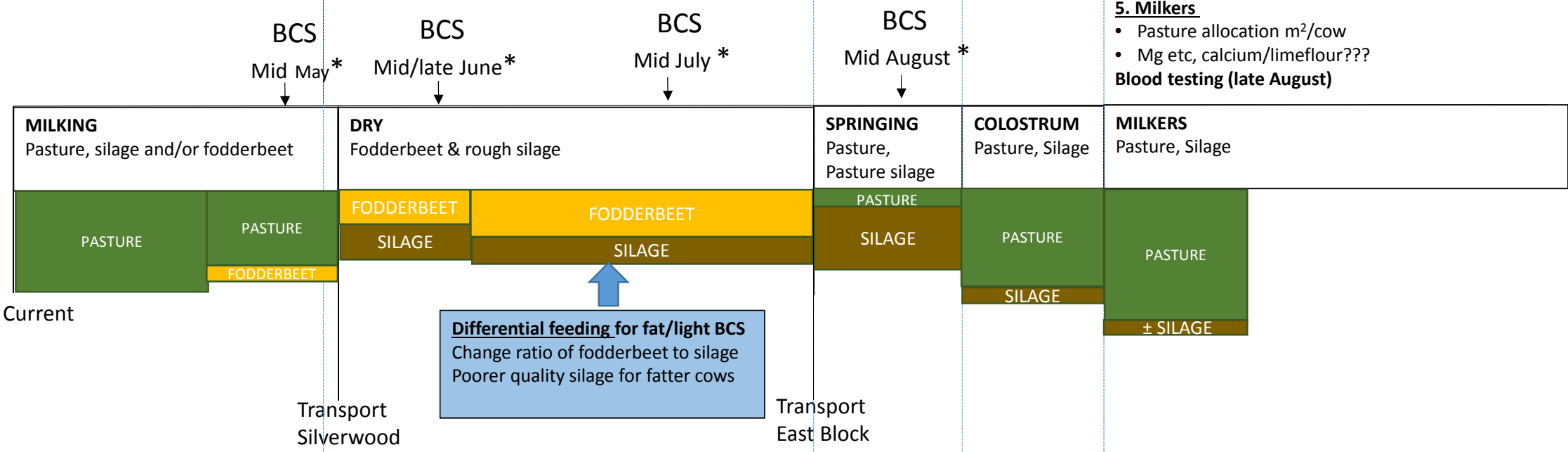
- Feed test/macros milking platform pasture
- Feed test/macros Silage (s)

Blood testing (early August)

5. Milkers

- Pasture allocation m^2/cow
- Mg etc, calcium/limeflour???

Blood testing (late August)



***BCS** = *Individual* cow BCS on each occasion – Approximately monthly – generate frequency histograms

LUDF preliminary wintering plan 2017

Fodder beet timeline of events

	27/03	28/03 to 3/04	4/04 to 10/04	11/04 to 17/04	18/04 to 24/04	25/04 to 1 May
Feeding levels (kgDM/cow/day)	0.88	1.0	1.8	1.3	1.57	2.0
Plant components	Bulb + Leaf	Bulb + leaf	Bulb and leaf then bulb only	Bulb	Bulb	Bulb
Method	Lift + broken	Lift + broken	lifted	lifted	lifted	lifted
DM% (E: estimated; A: actual)	15-18% E	15-18% E	Bulb and leaf – DM% est then purchased - 20% A	20%	20%	20%
Source	Jackie's	Jackie's	Purchased	Purchased	Purchased	Jackie's
Feeding order	Grass, fodder beet Then Silage	Grass, fodder beet then silage	Grass, fodder beet then silage	Grass, silage fodder beet for 2 days then fodder beet first	Remaining grass from 24 hr grazing, fodder beet, then silage and additional pasture	Remaining grass from 24 hr grazing, then fodder beet, then silage
Grass Silage (kgDM/cow/day)	1.7	3	6.5	6.1	6.4	6
Visible health issues	NO	NO	4 Downer cows treated for acidosis + antibiotic shot	1 dead cow 5 downer cows treated for acidosis + antibiotic	NO	NO
Rainfall events	0	10 ml	53 ml	77 ml	0	10ml
Management change			After 2 days switched to bulb only / diff variety	Remaining grass from 24 hr grazing, fodder beet, silage	Back fencing into previous break to remove some of the free choice between forages	

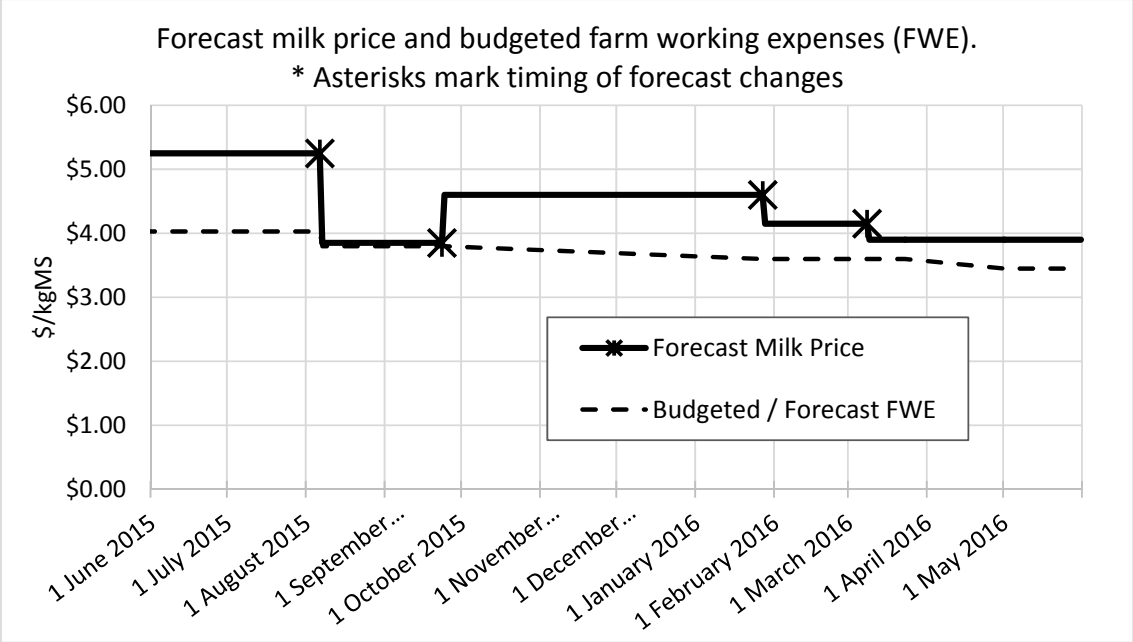
Key lessons learned this far in the use of fodder beet:

1) Testing for DM% is fundamental to understand exactly how much fodder beet is being fed
2) High level of animal husbandry is required in the use of this crop
3) Compounded effects are believed to have contributed to the health issues at LUDF:
    a. The onset of extremely wet weather prevented the daily lifting of fodder beet with a beet bucket
    b. A different source of beet was sought to replace the initial daily lifted beet (and leaf)
    c. The purchased fodder beet had little leaf as opposed to bulb + leaf from Jackies. The loss of leaf was not factored into the feed change
    d. The purchased fodder beet also had a higher DM%, this was initially unknown and not factored into the feed changes. It could have contributed to 0.2-0.5 kgDM difference in amount fed. (1.5kgDM @ 15%DM = 10kg wet weight whereas 1.5kgDM @ 18% = 8.3kg wet weight. 10kg wet weight @ 20% = 2kgDM).
    e. Cows did not graze normally due to the wet weather so there was not previous gut fill.
    f. In the wet, the cows grazed the easy feed to harvest i.e. fodder beet and silage. This could have meant that cows that were eating the crop well, would have eaten even more to fill themselves quickly in the bad weather.
    g. In the week 11-17 April, there was an already subclinical acidosis issue from the previous week's bad weather event. Together with the above, resulted in the health issues reported and the loss of 1 cow.
4) Phosphorus supplementation is very important. More than one way of getting P into cows must be used to ensure they ingest it even in wet weather
5) A wet weather feeding plan must be put in place, ensuring cows are not challenged to eat any more fodder beet than they were before (and even less if possible)
6) Since early April, additional phosphorus has been added as follows
    a. DCP at 47g/cow/day. This dusted onto the silage. Provides approximately 9g P/cow/day
    b. In addition, Soluphos is going into the Dosatron at 30g/cow/day providing approximately = 7.8g elemental P /cow/day

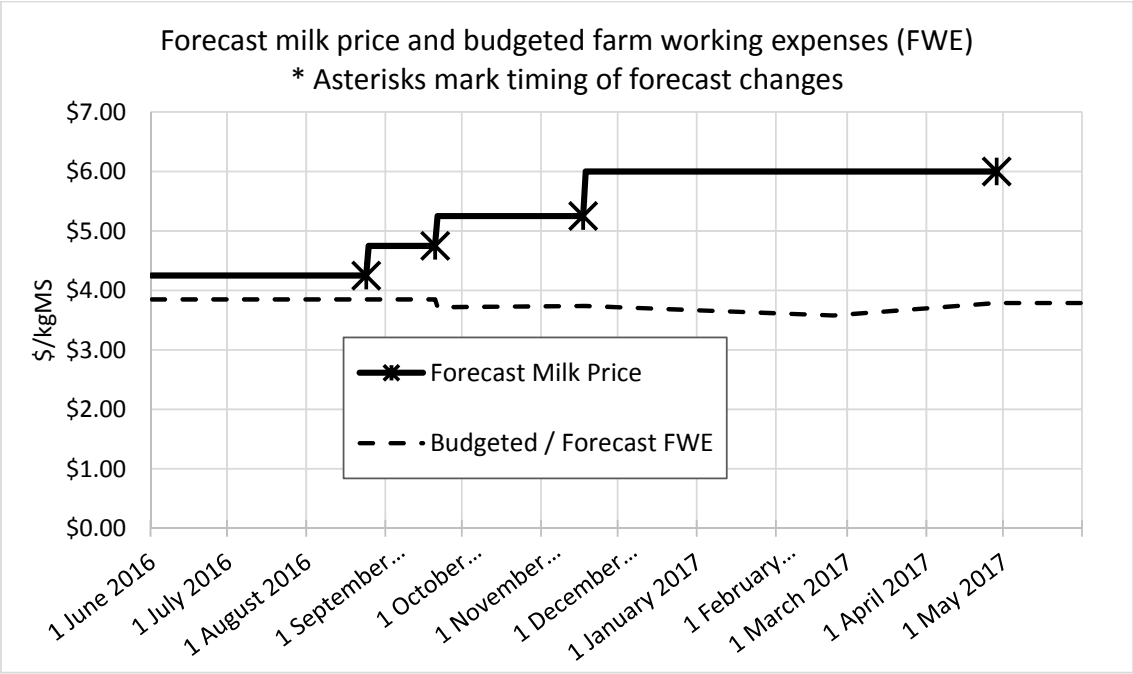
Draft Budget 2017-18:

Forecast Milk Income – 2015-16 vs 2016-17

2015-16 Production Year



2016/17 Production Year (to date)



Notes and assumptions regarding 2017-18 Budget

Income:

- Same No cows wintered, hope to achieve 560 peak milked.
- Increase in feed purchased (see below) contributing to higher budgeted milk production.
- 20 bulls purchased and sold rather than 16.

Expenses:

- Animal health – minor changes such as change to include IBR vaccination for calves. Teat sealing of heifers budgeted with vets (on mobile platform at winter grazing block) rather than done on platform at LUDF.
- Breeding – budgeting again for standard 4 rather than 2 herd tests, extra KAMAR's (2 per cow), management costs of 20 rather than 16 bulls for breeding.
- Electricity – same.
- Employment, now includes rental allowance as part of the salary cost, reflecting the impact on salaries of rent allowances.
- An additional expense line has been added to credit the above rental income to the farm. This treats housing income in the same manner as stock purchases (which are included as an expense within income). Rental accommodation allowances adds 21 cents/kgMS to the farm salary costs, but the net effective on operating profit is the same, as the farm receives the rental income.
- Imported Supplement – retained 300kgDM/cow silage and added 200kgDM/cow fodder beet. May not need 300kgDM silage as well as FB but keeping in budget. FB has lower cost per MJ energy but less flexibility than grass silage.
- Gibberellic Acid – left in budget but only one application across farm as have not been able to use in recent years with longer grazing rotations.
- Retained budget of 170kgN/ha.
- Fertiliser - budgeted on maintenance requirements applied to the whole farm. In practice will continue with whole farm soil testing and fertilising according to paddock requirements.
- Irrigation – extra $20,000 for irrigation R&M (esp Nth pivot).
- Regrassing - budgeting for 2 paddocks plus some undersowing if required to restore any damaged areas.
- R&M – decreased R&M budget for lanes but increased budget for pivot ruts as costing more - from $6000 to $9000.
- Shed and vehicle expenses are the same.

Dairy operating Profit:

Overall an increase of nearly $100,000 in expenses, but $134,000 increase in budgeted income resulting in a lift in operating profit of $200/ha (5%).

Lincoln University Dairy Farm 2017-18 Budget

Year ending May 31 2018				16-17 Budget		Difference	
Milk production (kgMS)	291,399	1,821/ha			280,000	11,399 kgms	
Peak No Cows	560cows	3.50/ha	*520/cow*		1,750/ha		
Staff (FTE)	3.70						
Income			*$/kgMS*	*$/kgMS*		$ change	
Milksolids	1,748,396	87%	$6.00/kgms	*6.00*	1,680,000	68,396	4%
Dividend	87,128	4%	$0.30/share	*0.30*	83,720	3,408	
Surplus dairy stock	36,400	2%	*0.12*	*0.40*	112,959	20,750	-68%
Other stock sales	80,361	4%	*0.28*	*0.00*		80,361	
DairyNZ levy	- 10,490	-1%	*-$0.04*	*-0.036*	-10080	-410	
	1,941,795	**100%**	***6.66***	***6.67***	1,866,599	75,196	4%
Less Stock Purchases	*30,000*		*0.10*	*0.09*	*24,000*	*6,000*	
Gross Farm Revenue	**1,911,795**		*6.77*	***6.58***	**1,842,599**	**69196**	**4%**
	11,949/ha				**11,516/ha**		
Expenses		**$/cow**	***$/kgMS***	***$/kgMS***	$		
Administration	24,700	44.1	**0.08**	**0.09**	24,700	0	0%
Animal Health	55,236	98.6	**0.19**	**0.19**	53,562	1,674	3%
Breeding Expenses	47,634	85.1	**0.16**	**0.15**	42,881	4,753	11%
Electricity-farm	30,000	53.6	**0.10**	**0.11**	30,000	0	0%
Employment	307,435	549.0	**1.06**	**0.94**	261,945	45,490	17%
Rental Income - Housing	- 62,400	- 111.40	**- 0.21**			- 62,400	
Imported supplement	95,694	170.9	**0.33**	**0.22**	62,160	33,534	54%
On Farm Silage harvesting	18,240	32.6	**0.06**	**0.07**	18,240	0	0%
Replace grazing & meal	143,504	256.3	**0.49**	**0.53**	149,091	-5,587	-4%
Winter graz - incl freight	159,575	285.0	**0.55**	**0.54**	149,952	9,623	6%
Gibberellic Acid	6,560	11.7	**0.02**	**0.05**	13,120	-6,560	-50%
Nitrogen	45,889	81.9	**0.16**	**0.16**	45,485	404	1%
Fertiliser & Lime	26,240	46.9	**0.09**	**0.09**	26,255	-15	0%
Irrigation - All Costs	83,600	149.3	**0.29**	**0.23**	64,600	19,000	29%
Rates & Insurance	21,020	37.5	**0.07**	**0.08**	21,020	0	0%
Regrassing	20,215	36.1	**0.07**	**0.07**	20,215	0	0%
Repairs & Maintenance	50,000	89.3	**0.17**	**0.19**	54,000	-4,000	-7%
Shed Exps excld power	9,850	17.6	**0.03**	**0.04**	9,850	0	0%
Vehicle Expenses	31,336	56.0	**0.11**	**0.11**	31,336	0	0%
Weed & Pest	500	0.9	**0.00**	**0.00**	500	0	0%
Cash Farm Work. Exps	**1,114,830**	**1991**	**3.83**	**3.85**	**1,078,912**	**35,918**	**3.3%**
Depreciation est	116,000		***0.40***	**0.41**	116,000		
Total Operating Expenses	1,230,830		***4.44***	**4.27**	1,194,912		
Dairy Operating Profit	**680,965**		**2.34**	**2.31**	**647,687**	33,278	
DOP	**4,256/ha**				**4,048/ha**	208	
Cash Operating Surplus	**796,965**				**763,687**	**33,278**	
	4,981/ha				**4,773/ha**		

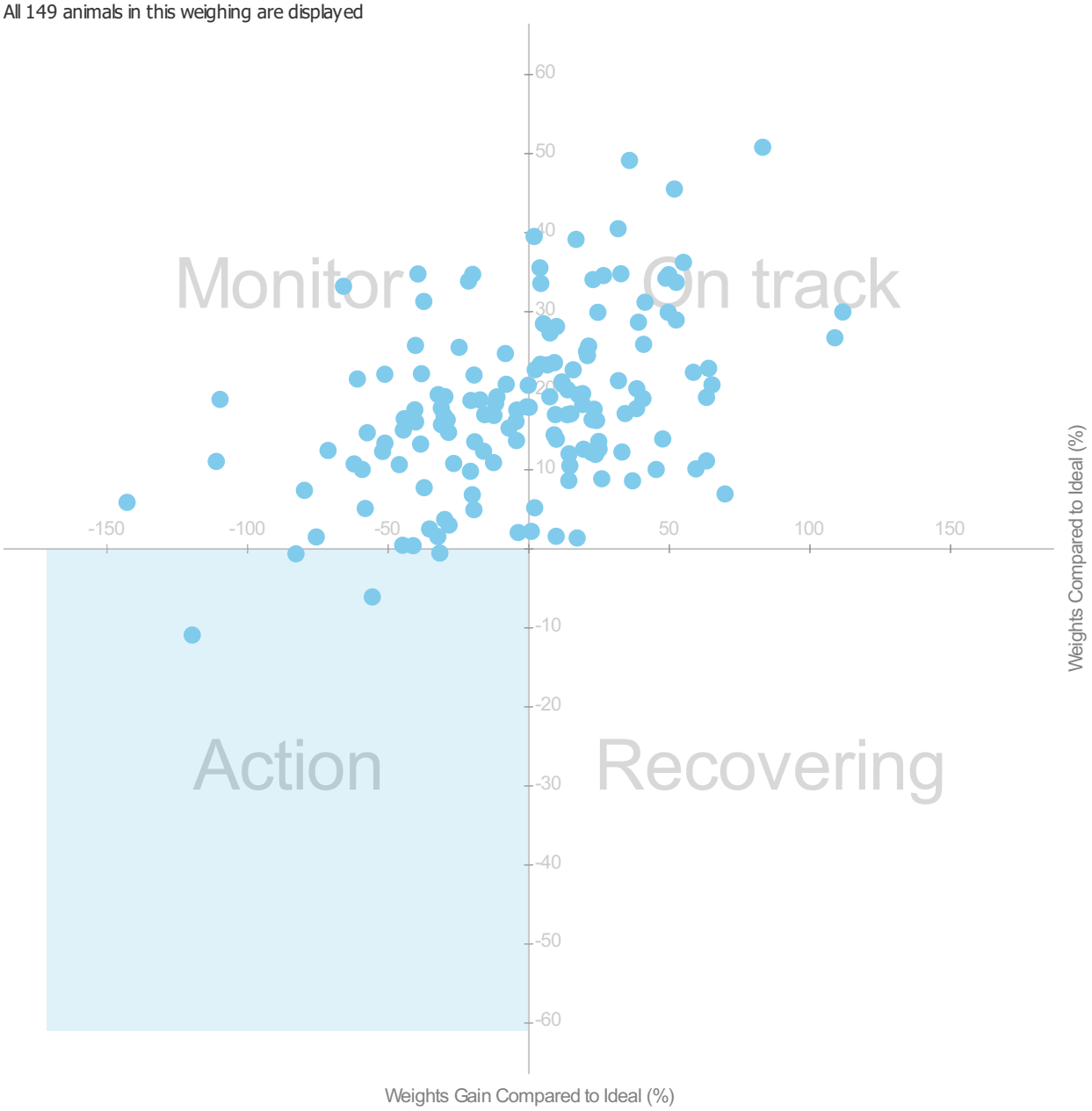
2016 Spring Born

20/04/2017

BQCY

Animal performance

All 149 animals in this weighing are displayed



Take action with these animals

Official Id	AE Breed	Current Weight (Kg)	Weight Gain (Kg/day)	Gain Required by PSM (Kg/day)	Variation from Ideal (%)	Previous Category
BQCY-16-59	HF x J	166	-0.55	0.68	-10.93	Monitor
BQCY-16-103	HF x J	189	0.29	0.59	-0.55	On Track
BQCY-16-104	HF x J	172	0.06	0.62	-6.10	On Track
BQCY-16-152	HF x J	187	-0.23	0.58	-0.65	On Track

Showing 1 to 4 of 4 entries

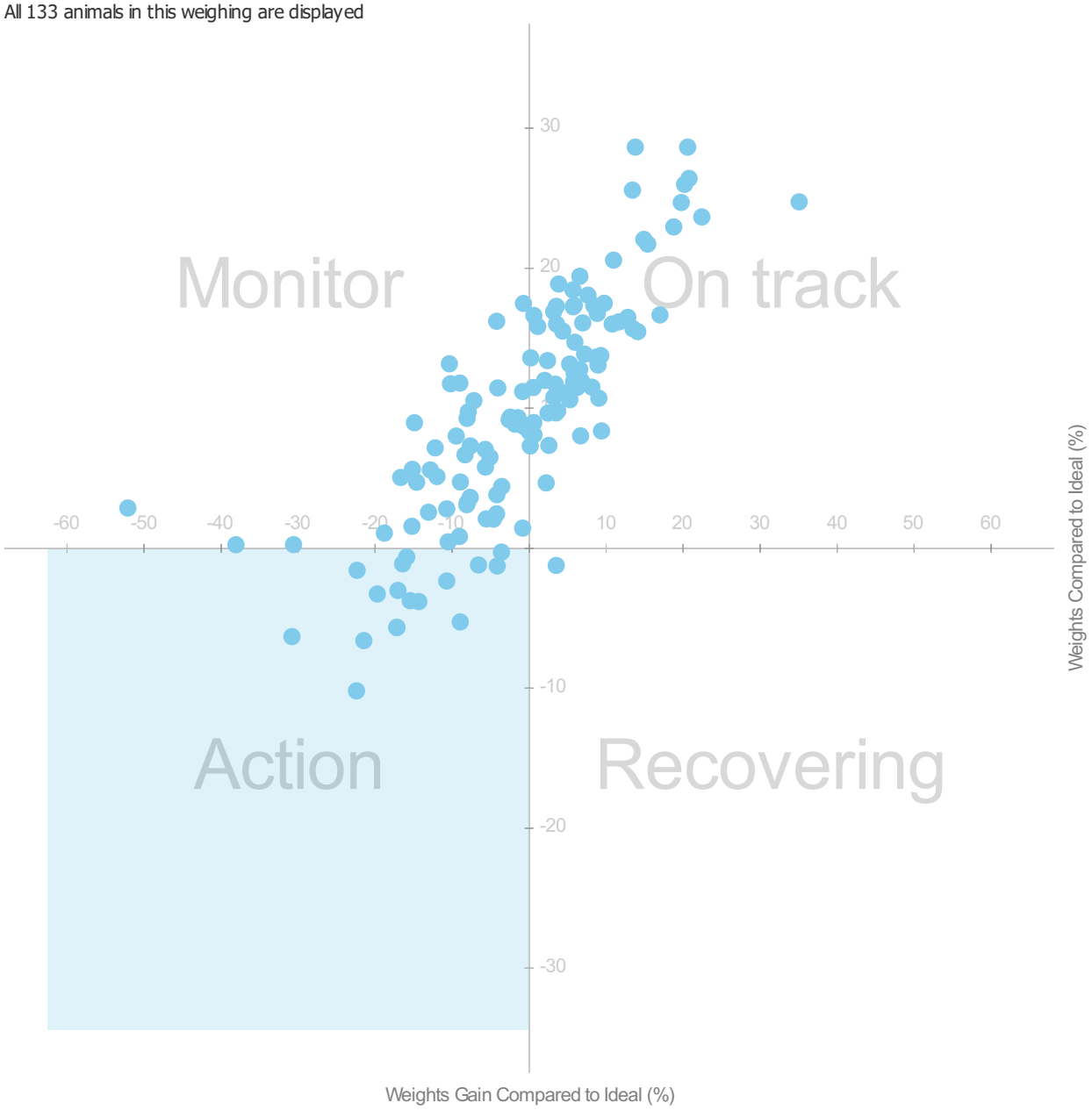
2015 Spring Born

27/04/2017

BQCY

Animal performance

All 133 animals in this weighing are displayed



Take action with these animals

Official Id	AE Breed	Current Weight (Kg)	Weight Gain (Kg/day)	Gain Required by PSC (Kg/day)	Variation from Ideal (%)	Previous Category
BQCY-15-18	HF x J	444	-0.57	0.58	-1.58	On Track
BQCY-15-28	HF x J	406	-0.06	0.63	-3.81	On Track
BQCY-15-41	HF x J	420	-0.11	0.66	-3.75	On Track
BQCY-15-42	HF x J	458	0.34	0.53	-0.28	On Track
BQCY-15-44	HF x J	388	-0.17	0.93	-10.19	Action
BQCY-15-71	HF x J	412	-0.34	0.62	-3.27	On Track

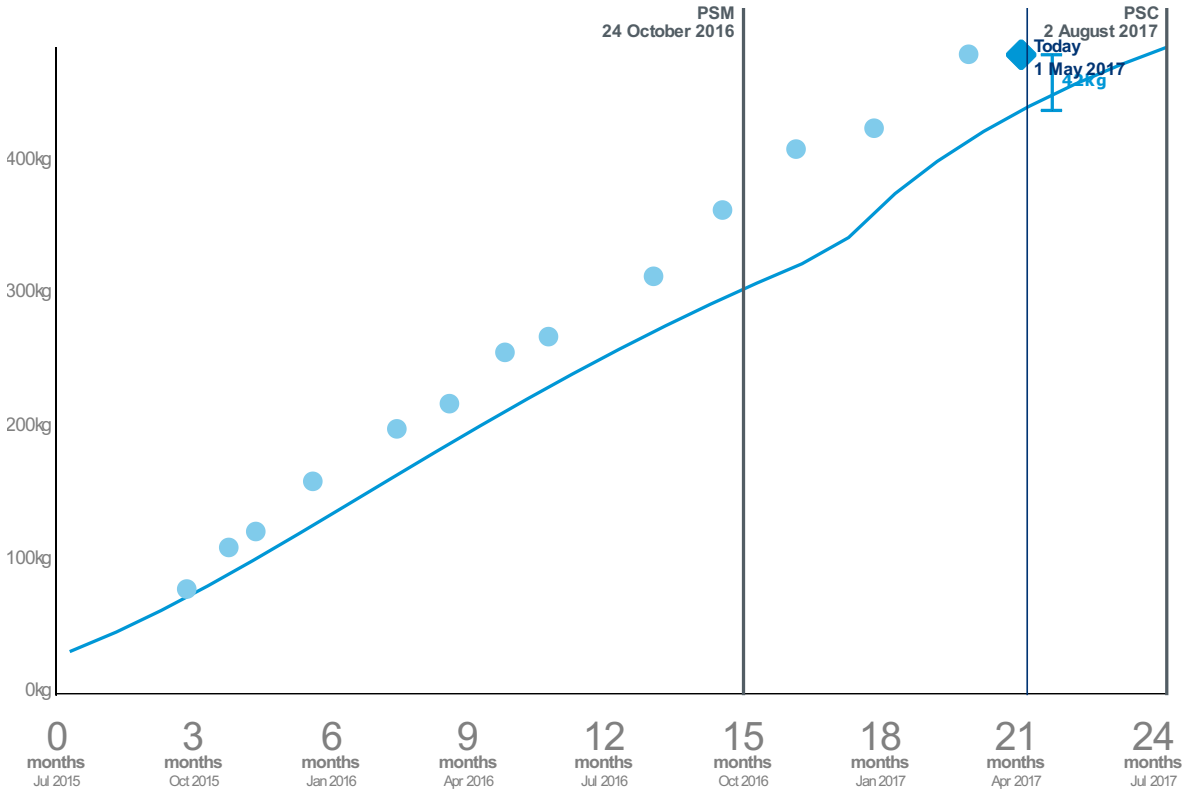
2015 Spring Born

27/04/2017

BQCY

Young stock trend

All 133 animals in this weighing are displayed



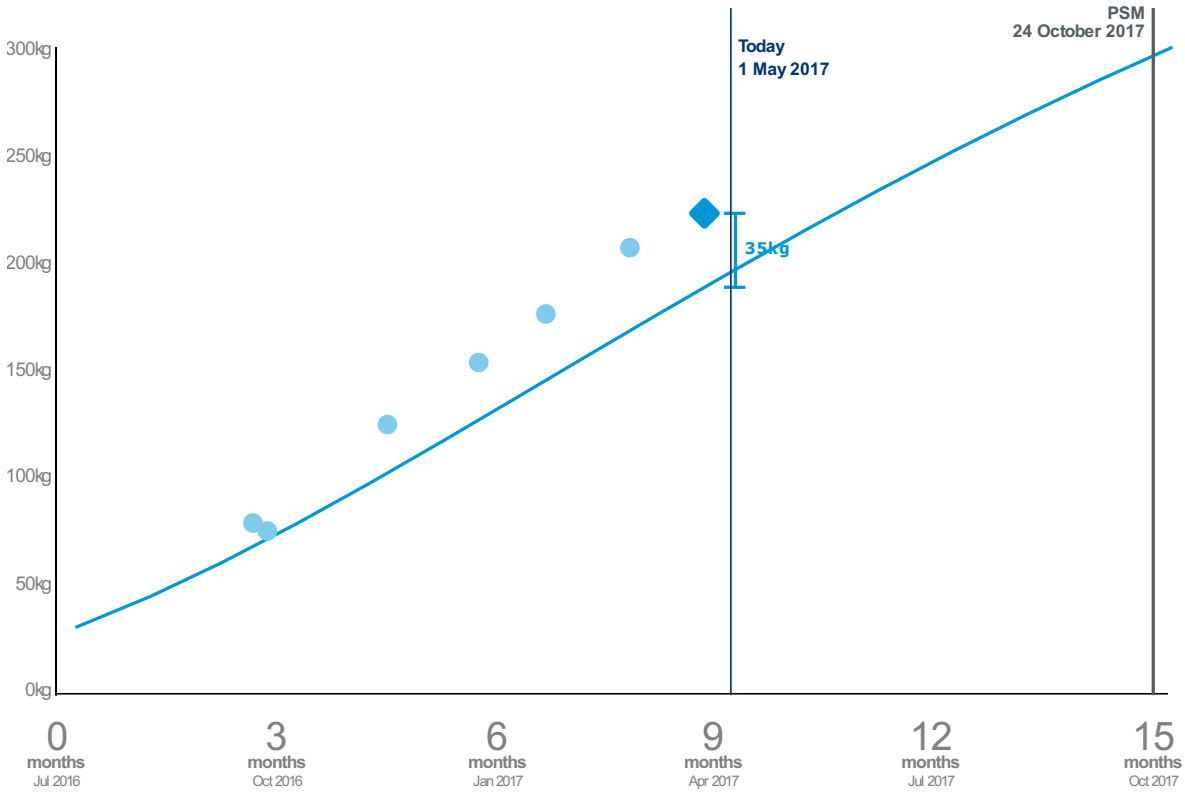
2016 Spring Born

20/04/2017

BQCY

Young stock trend

All 149 animals in this weighing are displayed



LUDF Farm Walk Notes

Tuesday 2nd May 2017

LUDF – focus for 2016/17 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 million and Target production of over 500kgMS/cow (>100% liveweight in milk production).

Critical issues for the short term

1. **Observe grazing behaviour of herd as fodderbeet has been introduced into the diet.**
2. **Hold the rotation length to minimum of 35 days as we head later into the autumn**
3. **Set the farm and herd up for next season with round length and BCS monitoring and management**
4. **Remain focussed on average pasture cover and pasture quality to ensure enough good quality pasture is offered daily to ensure good production.**
5. **Monitor cow BCS changes.**

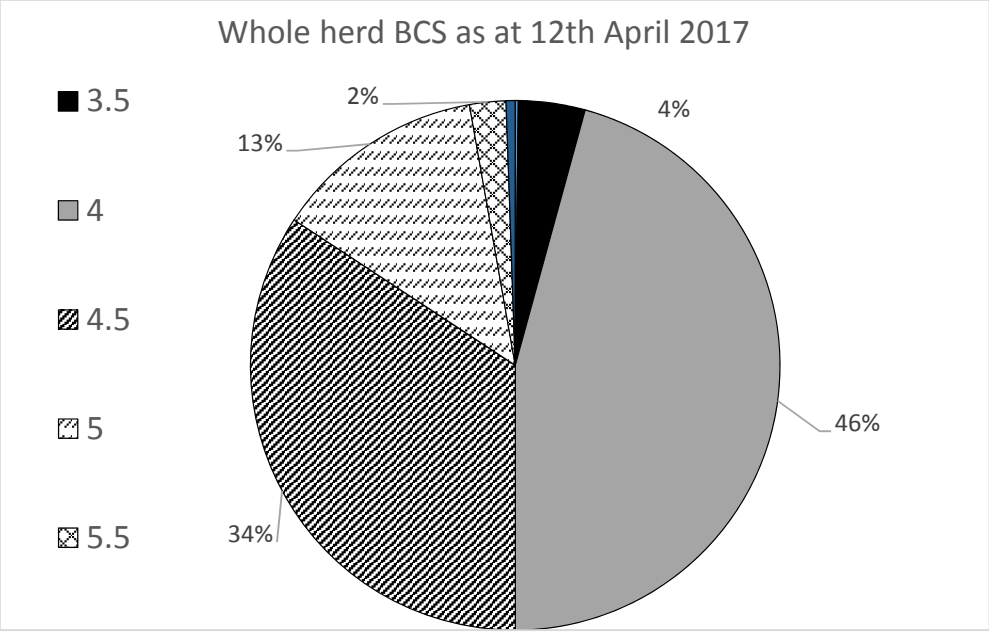
Key Numbers - week ending Tuesday 2nd May 2017

Ave Pasture Cover	2636 kgDM/ha	Pasture Growth Rate	44 kgDM/ha/day
Round length	43.4 days	Ave Supplement used	8 Kg/DM/Day - comprising: 6.0 kgDM/cow/day silage + 2.0 kgDM fodder beet/cow/day
No Cows on farm	541 (532 in milk)	Ave Soil Temp (week)	11.2°C
Kg MS/cow (546 cows)	1.5	SCC	169,000
Milk Protein : Fat ratio	0.79	Protein: 4.69%	Fat: 5.95%

Herd Management

6. A total of 541 calved cows are on farm. Of those 532 are in milk and the rest have been dried off. There are 2 milking herds and the make up of them has changed.
7. The small herd (160 cows) now comprises all cull cows and approximately 70 higher condition score cows (cows with BCS at 5 or above). This herd will follow the main herd and be used to ensure target grazing residuals are achieved as the farm completes the last grazing round before the winter.
8. The large herd comprises all other animals
9. There are 530 cows going into the vat, with 492 cows on twice a day milking, 38 once a day.
10. There were 2 new cases of mastitis over the past week (72 clinical cases season to date vs 94 cases at the same time last season).

11. This week, there were 7 new cases of lameness (192 cases season to date vs 176 cases same time last year).
12. Trace minerals and magnesium chloride are running through the stock water to all cows on the milking platform.
13. Phosphorus is being supplied both through water troughs and also dusted on silage.
14. Average herd liveweight (whole herd) for the week was 507 kgLW, 2 kg higher than as last week. The monitor group (281 early calving MA cows) was 504 kgLW, also up 2 kg compared with last week.
15. All cows in the herd have been BCS on the 12th April. The average for the herd has remained at 4.3 (same as last month), however there was a small shift of cow number towards higher BCS groups.

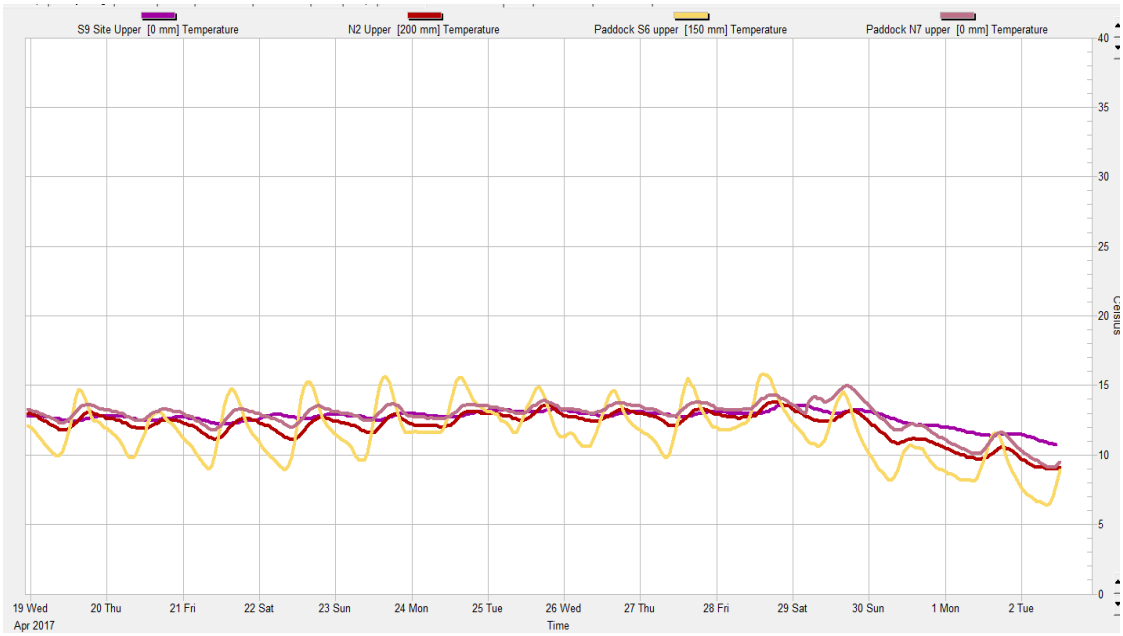


16. 11 cows have been dried off: 5 low BCS early calving cows and 6 lame cows. They have remained on the platform and are still receiving fodderbeet daily.
17. Calves have been weighed and drenched and have received the Lepto booster vaccination and a copper bullet in readiness to be moved to the young stock rearing facilities in Silverwood where they'll be wintered on fodder beet.
18. R2 heifers will be weighed and receive the Lepto vaccine, copper bullet and drench on the 27th April in readiness to go into the fodder beet for winter.

Growing Conditions

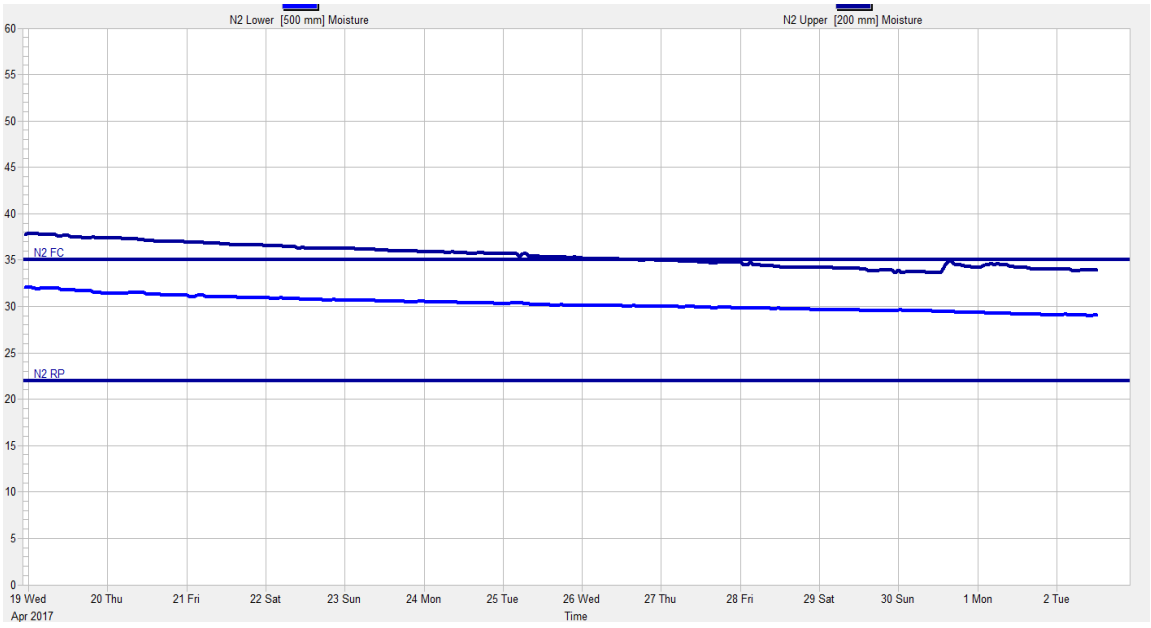
19. The average 9 am soil temperature for the past week has decreased 0.4°C to 11.2°C. Soil temperatures are slightly below this same time last year (11.8°C).

Figure 1: Soil temperature history for the last 2 weeks



20. The farm received 15.6 ml of rain on Sunday. This contributed to the new spike in lameness. Soil condition remain wet although not as bad as a few weeks ago.

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

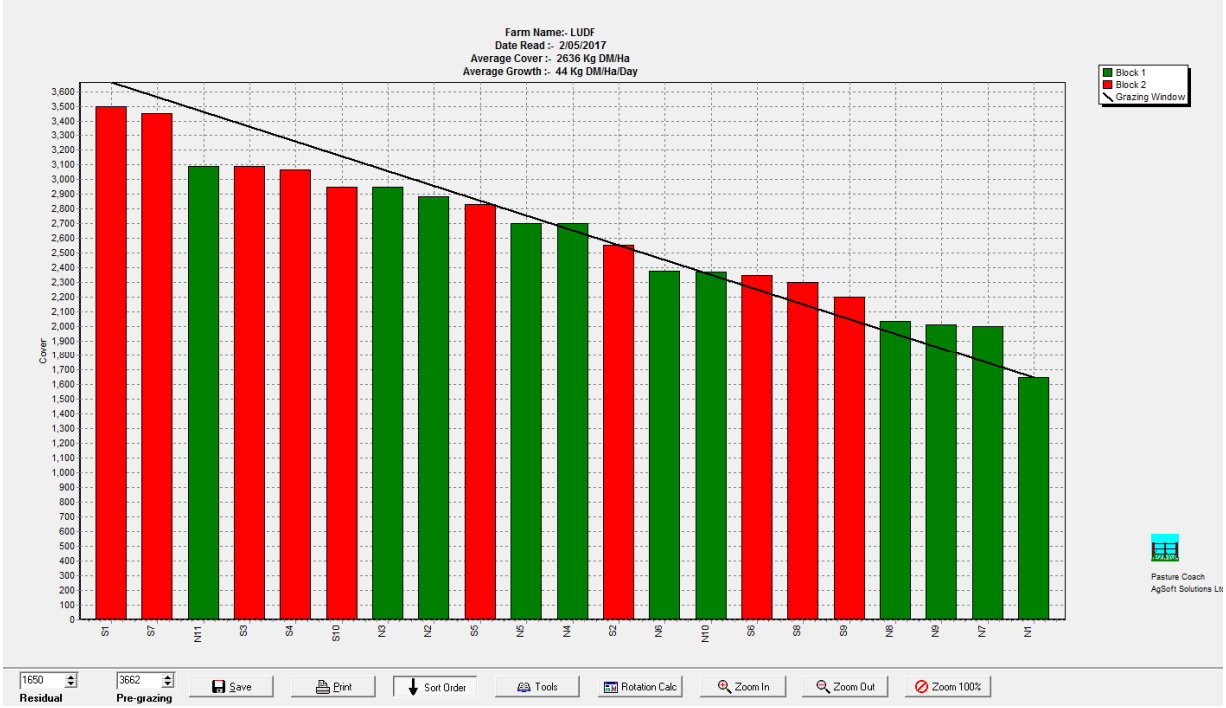


21. A total of 173kgN/ha has been applied to the platform for the season. The N application finished in early April.

Pasture and Feed Management

22. Cows have managed a 43.4 day round this week using 6.0 Kg DM/cow/day silage fed and 2.07 Kg DM fodder beet/cow/day average for the week (a 0.5 kgDM/cow/day of fodder beet increase from the last week).
23. Over the past two weeks, to assist with getting the whole herd eating fodderbeet, cows have been back fenced in their night grazing area after morning milking and then fed fodder beet before the silage and additional pasture. This process sought to stimulate fodder beet uptake by removing additional pasture / silage at this time of the day.
24. There have been no more animal health issues related to fodder beet feeding, however there are still approximately 20% of the herd that are not consuming fodder beet. At present it appears as though the remainder of the herd may be unlikely to take up eating fodder beet while milking this autumn.
25. Over the next 2 weeks, the plan is to gradually increase the fodder beet offered to an average of 3 kg DM/cow/day. As only 80% of the herd is eating the crop, this means about 5 kgDM/cow/day for those animals that are eating it.
26. Cows will be re-transitioned when they get to the wintering block to ensure that the remaining 20% of the herd does go onto the crop and consumes it through winter. There is a limited amount of grass and grass silage in place for a small number of cows if they don't take to the fodder beet over the winter.
27. In general, there is no visually evident loss of pasture quality. Half of paddock S5 (our newest regrassed paddock) has some decay at the bottom of the sward as cows were prematurely taken out of the paddock at the last grazing when the wet weather hit (to avoid pugging damage). Paddock S6 also has areas where there is decay at the bottom of the sward, this paddock is particularly hard to graze down well due the dock infestation there.
28. Rising Plate Meter data collected on the farm walk continues as an average of 2-3 plate meters and some discussion on the likely available feed that the herd will consume. This change in approach (since early February 2017) has provided a more realistic data set, including APC. Pasture growth however remains a challenge to explain.
29. Pasture quality from samples collected on 18th April showed:
    a. Average of 13.2% DM (after 2 consecutive weeks at 10%).
    b. Energy content of 12MJME/kgDM
    c. Protein levels at 19.5 %
    d. Average NDF% of 39%

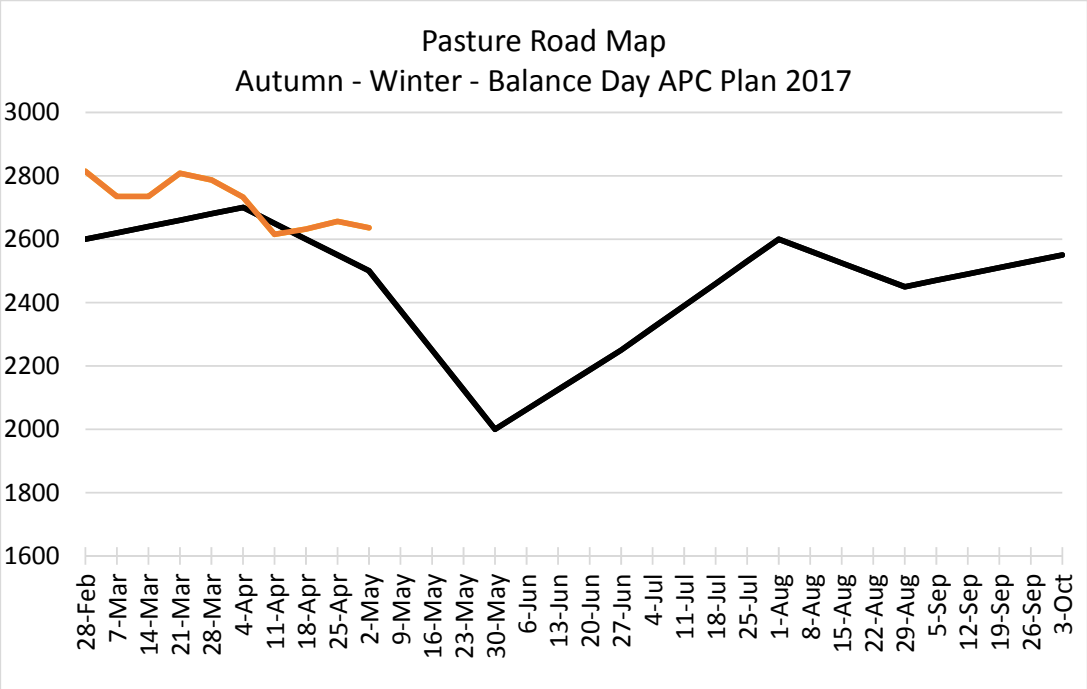
Figure 3: This week's feed wedge



30. The demand line on the pasture wedge graph is calculated as follows:
    a. 541 cows (dry stock remains on platform) on 160 ha: 3.4 cows/ha.
    b. In terms of round length, we plan to shorten the round length for the coming weeks, and start eating into the (excess) available cover rather than continue to use silage to support average pasture covers.
    c. The target is to run a 35 day round. Over 160 ha this equates to 4.57 ha/day
    d. The dry matter intake for the current level of milksolids production (and a little weight gain) is around 17 kgDM/cow/day
    e. Total demand: 17 kgDM/cow/day x 541 average cows for the week = 9,197 kgDM/day (57 kgDM/ha/day)
    f. Demand (if supplied solely from pasture) of 9,197 kgDM/day from 4.57 ha/day requires 2,012 kgDM/ha available.
    g. Assuming the target residual is 1,650kgDM/ha (paddocks are being tidied up as this is the last round of the season), target pregraze covers are 3,662 kgDM/ha. (1,650 kgDM/ha + 2,012 kgDM/ha = 3,662 kgDM/ha pregraze cover).
    h. Target APC would therefore be (3,662+1650)/2 = 2,656 kgDM/ha

31. The feed wedge above is calculated as if cows were being fully fed on grass (17 kgDM/cow/day) and it estimates a feed deficit of around 6 tDM total.
32. Average pasture cover this week, has virtually remained the same as last week (2,632 kgDM/ha vs 2636 kgDM/ha).

33. Demand is 57 kgDM/ha/day and growth according to Pasture Coach was estimated at 44 kgDM/ha. This means cows would have required 13 kgDM/ha/day of supplements for the average pasture cover not to change if growth was as stated.
34. In practice feeding 8kgDM/cow/day at 3.4 cows /ha is 27.2 kgDM/ha/day, implying the growth rate was more likely 30kgDM/ha/day.
35. Whether the growth is being overestimated or the covers are being overestimated is not clear, what is evident is it is only by adding in supplement that the farm has been able to hold onto the average pasture cover at the current level through April.



Feeding Management for the coming week:

36. Animals in each herd have been redrafted and the small herd (fat and cull cows) will start being used to ensure residual postgrazing targets are achieved in all paddocks grazed (1650 kgDM/ha).
37. Considering the BCS data, weather forecast and the availability and costs of supplements, the following strategy is being followed:
    a. Keep as many animals in milk as possible for the longest period possible (final dry-off date for this farm is usually around the 25-28th May). We have a higher than targeted average pasture cover that we are hoping will allow us to achieve this (plus cover our us for wet weather spells)
    b. Only drop culls if the average pasture cover starts dropping too quickly
    c. Continue drying cows off on autumn dry-off rules for BCS gains.
38. Quick calculations say that it is still profitable to feed this level of supplements to empty cows (17 kgDM/cow/day x 0.30$/kgDM supplement = $5.1/cow. At 1.5 kgMS/cow/day production, on average each cows is returning $9/cow/day)
39. In connection to the fodder beet transition, the current system of feeding the beet after morning milking before the silage will continue – including -

a. Ongoing observation of cows. Careful observation of the herds will be made moving forward, watching for signs of acidosis including rumen fill, cud chewing, dung consistency, evidence of a secondary milk fever and amount of milk being produced by each cow.
b. Cows that are suspected of showing signs of ruminal acidosis will treated and moved into the OAD mob

40. Feeding nearly 200 kgDM/cow silage and fodderbeet over the last 4-5 weeks has allowed the farm to accumulate 140 kgDM/ha above the target pasture cover, however this will now be used to replace the silage that is being brought in.
41. Feeding:
    a. The aim is to hold to a 35 day round (which could end of being faster depending on weather conditions).
    b. Both herds will continue to get fodder beet in their diet.
    c. The large herd will also get some silage in the diet, with the view to reduce the amount gradually over the next 3 weeks to allow the herd to harvest the excess cover through the farm.
    d. The small herd will be pushed to achieve 1650 kgDM/ha residuals n all paddocks.
    e. The above will ensure the appropriate set up of the farm for drying off at the end of the month.
42. Grazing decisions will continue to be influenced by cow behaviour and pasture growing conditions, taking particular note of area grazed per day.

LUDF Weekly report	4-Apr-17	11-Apr-17	18-Apr-17	25-Apr-17	2-May-17
Farm grazing ha (available to milkers)	160	160	160	160	160
Dry Cows on farm / East blk /Jackies/other	1/0/0/0	0/0/0/0	0/0/0/0	9/0/0/0	10/0/0/0
Culls (Includes culls put down & empties)	0	0	0	0	0
Culls total to date	22	22	22	22	22
Deaths (Includes cows put down)	0	1	1	0	0
Deaths total to date	15	16	17	17	17
Calved Cows available (Peak Number 560…)	542	542	541	532	532
Treatment / Sick mob total	1	1	1	0	2
Mastitis clinical treatment	1	1	1	0	2
Mastitis clinical YTD (tgt below 64 yr end)	68	69	70	70	72
Bulk milk SCC (tgt Avg below 150)	146	149	173	157	169
Lame new cases	16	10	30	5	7
Lame ytd	140	150	180	185	192
Lame days YTD (Tgt below 1000 yr end)	3962	3962	4627	4837	5082
Other/Colostrum	0	0	0	0	0
Milking twice a day into vat	501	502	483	497	492
Milking once a day into vat	40	38	57	35	38
Small herd	150	154	148	150	147
Main Herd	351	349	335	347	345
MS/cow/day (Actual kg / Cows into vat only)	1.64	1.53	1.50	1.50	1.49
Milk Protein/Fat ratio	0.79	0.76	0.79	0.77	0.79
Milk Fat %	5.76	5.92	5.95	6.08	5.95
Milk Protein %	4.56	4.57	4.70	4.70	4.69
MS/cow to date (total kgs / Peak Cows 560	445	454	466	475	486
MS/ha/day (total kgs / ha used	5.53	5.19	5.07	5.06	4.96

Herd Average Cond'n Score	0.00	0.00	4.30	0.00	0.00
Monitor group LW kg WOW 281 early calvers	495	495	499	502	504
Soil Temp Avg Aquaflex	15.5	12.9	13.2	11.8	11.2
Growth Rate (kgDM/ha/day)	59	46	60	56	44
Plate meter height - ave half-cms	16.0	15.1	15.2	15.4	15.3
Ave Pasture Cover (x140 + 500)	2733	2615	2632	2656	2636
Surplus/[defict] on feed wedge- tonnes	0	0	0	0	0
Pre Grazing cover (ave for week)	3559	3524	3545	3616	3611
Post Grazing cover (ave for week)	1800	1800	1800	1800	1800
Highest pregrazing cover	3850	3750	3600	3950	3600
Area grazed / day (ave for week)	5.23	5.07	4.45	3.92	3.68
Grazing Interval	31	32	36	41	43
Milkers Offered/grazed kg DM pasture	0.0	0.0	0.0	0.0	0.0
Estimated intake pasture MJME	0	0	0	0	0
Milkers offered kg DM Grass silage	0	0	0	0	0
Silage MJME/cow offered	0	0	0	0	0
Estimated intake Silage MJME	0	0	0	0	0
Estimated total intake MJME	0	0	0	0	0
Target total MJME Offered/eaten (includes 6% waste)	0	0	0	0	0
Pasture ME (pre grazing sample)	11.6	0.0	0.0	12.0	0.0
Pasture % Protein	19.0	0.0	0.0	19.5	0.0
Pasture % DM - Concern below 16%	13.7	0.0	0.0	13.2	0.0
Pasture % NDF Concern < 33	45.5	0.0	0.0	39.0	0.0
Mowed pre or post grazing YTD	277.2	277.2	277.2	277.2	277.2
Total area mowed YTD	310.4	310.4	310.4	310.4	310.4
Supplements fed to date kg per cow (555peak)	195.3	251.6	302.8	356.9	411.0
Supplements Made Kg DM / ha cumulative	361.47	361.47	361.47	361.47	361.47
Units N applied/ha and % of farm	25units /15.4%	25units /33.7%	0	0	0
Kgs N to Date (whole farm)	165	173	173	173	173
Rainfall (mm)	9.8	57.2	77.6	0	15.6
Aquaflex topsoil relative to fill point target 60 - 80%	70-90	100-100	100-100	90-100	90-100

Next farm walk: Tuesday 9th May 2017 at 9am. 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.

Peter Hancox, Farm Manager, Natalia Benquet, Charlotte Westwood.

DairyNZ Farmers' forum

Registration is free for levy-paying farmers and their staff.
Registration prior to the event is essential.

Please note that we may have to close registrations several days before the event once we reach venue capacity.

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dairynz.co.nz/farmersforum

or phone 0800 4 324 7969

Registration includes refreshment breaks and lunch.

DairyNZ Farmers' forum

LINCOLN

TUESDAY 16 MAY
9.30AM-3PM
ASHLEY DENE RESEARCH & DEVELOPMENT STATION
736 BETHELS ROAD
SPRINGSTON

dairynz.co.nz/farmersforum

DairyNZ Farmers' forum

LINCOLN
TUESDAY 16 MAY
9.30AM-3PM
ASHLEY DENE RESEARCH & DEVELOPMENT STATION
736 BETHELS ROAD
SPRINGSTON

PROGRAMME

9.30am Registration – tea and coffee

10.00am Introduction - Professor Grant Edwards, Lincoln University.

10.10am Welcome **Dr Tim Mackle, CE DairyNZ**

10.30am Science sessions presented by DairyNZ scientists and staff.
(*Lunch break from 12.45pm - 1.30pm)*

Are you making money from milk or milk from money?

- Marginal milk – when is enough too much?
  John Roche, principal scientist.
- Key lessons of intensification over the last decade.
  Mark Neal, dairy systems specialist.

Herd efficiency

- Making it easier for you to get better in-calf rates.
  Chris Burke, senior scientist.
- Getting your cows to have healthier, longer productive lives.
  Claire Phyn, senior scientist.
- Looking for cows that are the most efficient feed convertors.
  Mark Camara, senior quantitative geneticist.

Saving on nutrients

- Water quality, what is the problem?
  Justin Kitto, water quality specialist.
- Keeping sediment, phosphorus and E. coli on farm.
  Angela Harvey, catchment engagement leader.
- Reducing nitrate leaching from grazing animals.
  Ina Pinxterhuis, senior scientist.

Home-grown feed: now and future

- Today's pastures tomorrow: What we have learned in the last five years.
  David Chapman, principal scientist.
- Tomorrow's pastures tomorrow: Exciting new grasses and legumes from novel breeding methods.
  Greg Bryan, AgResearch.
- Cropping today and tomorrow: Have we reached peak fodder beet?
  Dawn Dalley, senior scientist.

2.15pm "Optimistic, excited and realistic - future technology" **Bruce Thorrold, strategy and investment leader.**

2.30pm Regional focus - **Virginia Serra, regional leader.**

3.00pm Afternoon tea.

3.10pm Optional farm tour.

DON'T MISS OUT!
REGISTER ONLINE NOW
DAIRYNZ.CO.NZ/FARMERSFORUM
OR PH 0800 4 324 7969

Welcome to Lincoln University Dairy Farm (LUDF).

The farm is a fully operational, commercial dairy farm with a number of potential hazards for both visitors and staff. Many of the potential hazards cannot be eliminated while also providing access to visitors therefore all staff and visitors MUST watch for potential hazards and act with caution.

Hazard Summary: Look, think, act.

The following chart provides a reminder of the types of hazards at LUDF. Watch for these and any other hazards that may be on farm today.

People: • Uninformed / ill prepared visitors may be the greatest risk	**Animals:** • **You are in their space**	**Milking shed:** • Moving rotary platform • Confined animals • Chemicals
Eyes / Ears: • Water / oil / milk / chemical splashes • Welding flashes • Loud machinery		**Touch:** • Hot / cold surfaces, hot water, chemical burns • Electric fences – treat them as high voltage power sources
On farm machinery and tools • Chainsaws, hand tools etc. generate noise, fragments	**Potential slips / trips:** • Uneven surfaces occur across the farm • Fences • Drains • Underpass • Effluent pond	**Vehicles:** • Contractors and farm equipment – **act as though they can't see you** – keep out of their way • Centre Pivot takes precedence over your plan

ARE YOU TRAINED FOR WHAT YOU ARE ABOUT TO DO? If not, STOP.

If you are uncertain how you should act or proceed, stop and contact the farm manager, other farm staff or your host.

By entering this farm, you are acknowledging your receipt of this hazard summary, and your agreement to take personal responsibility to watch out for potential hazards, and act in such a manner as to protect yourself and any others also on-farm.

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