SIDDC
South Island Dairying Development Centre

Partners networking to advance South Island dairying.

www.siddc.org.nz

FOCUS DAY FEEDBACK FORM

THIS IS YOUR MEAL TICKET – THAT'S RIGHT, SWAP THIS COMPLETED FORM FOR A SAUSAGE!

Thank you so much for coming along to the Focus Day today. We hope you have enjoyed your time at LUDF. Please complete these questions to help us improve and make this an even better experience for everyone.

Questions:

1. **How many Focus Days have you attended (approx.)?**

2. **How did you hear about today?** Please circle your answer.

Flyer in the mail	Facebook/ Twitter	I received an email
via Ravensdown	Word of Mouth	Other (please tell us how)

3. **What was the most important / useful / valuable part of today's event?**

4. **What is important for your attendance at future focus days?**

5. **Which topics would you like to see covered in the future?**

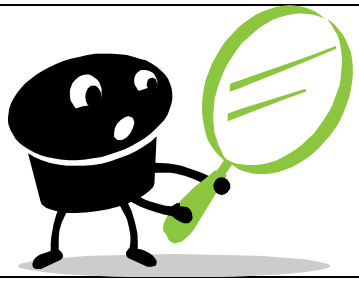
Contact us: 03 423 0022, office@siddc.org.nz, Facebook.com/LUDairyFarm, Instagram: ludairyfarm

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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CONTENTS

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. This Low Input, High Production, High Profitable, Low Nutrient Loss Farm System has been run at LUDF for 5 seasons already.

LUDF AUTUMN FOCUS

LUDF Profitability

The dairy farm is currently tracking to a $3.65 / kgMS operating cost structure. This would be a good result. Any thing under $3.90 / kgMS is very sound.

The operating costs exclude demonstration costs, eg, costs associated with testing etc, eg, Lysimeters, visitor costs etc.

Autumn Management

Over the past 3 years, there has been a wealth of knowledge and work go into making sure that the LUDF has the lowest foot print possible with the current science. By good management and application. This is also a very profitable position. Given these key drivers to LUDF, we will not be changing any thing in the farm system to chase high payouts. Key points:

- Culls will be gone 15th April at the latest.
- focus on cow condition – OAD light cows.
- Pastures will be looked after, the farm can get sodden and pastures can pug, destocking helps.
- Focus on pasture harvested and drying off with a cover of 1,900 kgDM/Ha.
- Minimal Supplement use, currently on track to 317 kgDM/cow of supplement use (including supplements made on farm).

Our focus is on the long term profitability of the farm rather than short term.

To make the most of a high payout, we are going to do exactly what we will do in a low payout, farm with the lowest cost and foot print possible – and bank the extra profit with a higher payout.

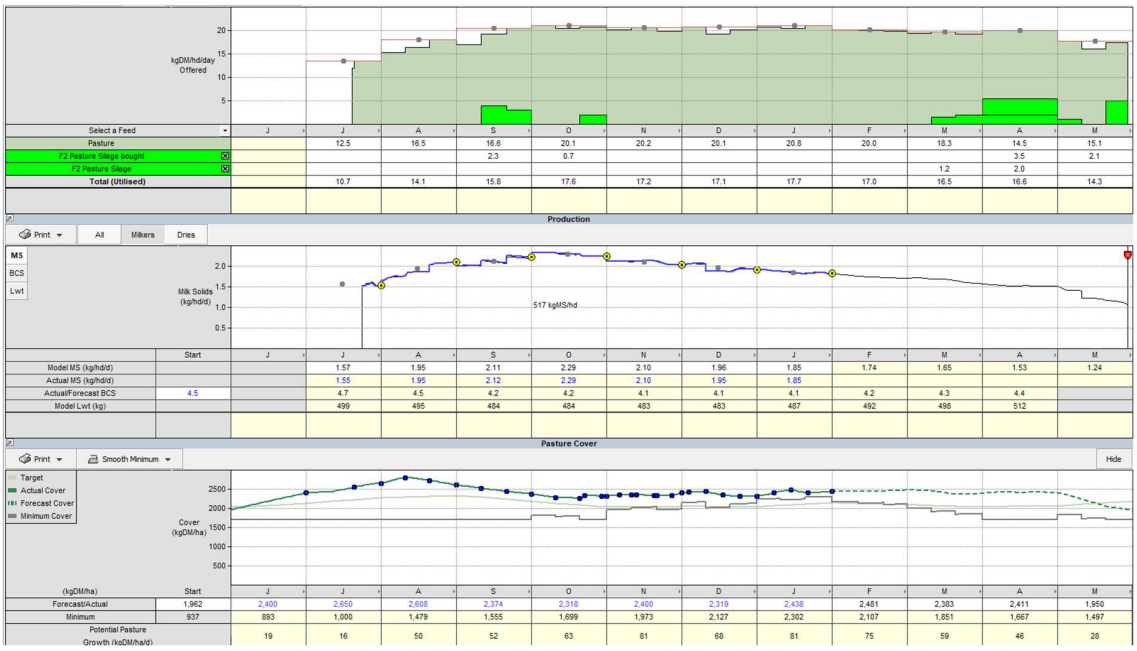
FARMAX YOUR ADVANTAGE
Dairy 7.1.2.57

Physical Summary for LUDF DSM

Jun 19 - May 20

Category	Description	Value	Units
Farm	Effective Area	160	ha
	Stocking Rate	3.5	cows/ha
	Potential Pasture Growth	19.4	t DM/ha
	Nitrogen Use	185	kg N/ha
	Feed Conversion Efficiency (eaten)	10.4	kg DM eaten/kg MS
Herd	Cow Numbers (1st July)	555	cows
	Peak Cows Milked	555	cows
	Days in Milk	282	days
	Avg. BCS at calving	4.9	BCS
	Liveweight	1,665	kg/ha
Production	Milk Solids total	285,313	kg
(to Factory)	Milk Solids per ha	1,783	kg/ha
	Milk Solids per cow	514	kg/cow
	Peak Milk Solids production	2.35	kg/cow/day
	Milk Solids as % of live weight	107.1	%
Feeding	Pasture Eaten per cow *	4.4	t DM/cow
	Supplements Eaten per cow *	0.2	t DM/cow
	Off-farm Grazing Eaten per cow *	0.7	t DM/cow
	Total Feed Eaten per cow *	5.4	t DM/cow
	Pasture Eaten per ha	15.4	t DM/ha
	Supplements Eaten per ha	1.2	t DM/ha
	Off-farm Grazing Eaten per ha	4.3	t DM/ha
	Total Feed Eaten per ha	20.9	t DM/ha
	Supplements and Grazing / Feed Eaten *	17.2	%
	Bought Feed / Feed Eaten *	6.5	%

(*) feed eaten by females > 20 months old / peak cows milked



SCENARIO AND ACTUAL PERFORMANCE MODELLING - OVERSEER

We have investigated the impact of farm program end of season tweaks from the current Revised model, and lined these models up against the baseline farm system as well as a higher N & stocking rate / lower per-cow production system.

Current (2018-19 Rev Apr) – N Loss 34 kgN/ha

- Modelled with Actuals YTD.
- 3.45 cows/ha stocking rate.
- Feeding feed made on platform + purchased supplement (144 TDM)
- Budgeted with cull dates as per plan.
- Milking to 30th May. Trucks booked 31st May for winter feed.
- Subject to autumn conditions – especially feed utilisation / pasture damage risk.

Low Autumn Supplement – N Loss 35 kgN/ha

- Feeding only feed made on platform (38 TDM)
- Culling pulled forward from 15th April to 20th March.
- Dry off 3 days earlier (27th Vs 30th May).
- Send cows off 3 days earlier (28th Vs 31st).

Note: The value of the lost milk production is very similar to the cost of feed.

High Autumn Supplement – N Loss 38 kgN/ha

- Feed additional supplement to gain days in milk (205TDM =+61 TDM)
- Culling delayed to 10th May.
- Dry off 30th May.
- Milking to 30th May. Trucks booked 31st May for winter feed.
- Feed Costs $0.34 / kgDM fed.

Note: The value of the increased milk production is very similar to the cost of feed.

Higher Stocking Rate – Moderate per cow production – N Loss 45 kgN/ha

- Peak Milk 624 cows
- 3.9 cows/ha stocking rate
- 450 kgMS/cow
- Nitrogen use 240 kgN/Ha
- Representative of some Canterbury systems

Base Line – N Loss 70 kgN/ha

- Farmax model constructed to represent baseline (2009 – 2013 period) farm system.
- Uses the average production and inputs for the base line period.
- Farmax modelling worked well with similar growth curve / higher stocking / more Nitrogen.

FARMAX YOUR ADVANTAGE Dairy 7.1.2.41

Compare Physical Summary

Jun 18 - May 19

Category	Description	LUDF DSM 201819 Rev Apr	LUDF DSM 201819 No Aut Suppl	LUDF DSM 201819 Hi Suppl	LUDF DSM 201819 High Stock Mid Cow	LUDF DSM Baseline	Units
Farm	Effective Area	160	160	160	160	160	ha
	Stocking Rate	3.5	3.5	3.5	3.9	4.1	cows/ha
	Potential Pasture Growth	19.6	19.6	19.6	18.3	18.3	t DM/ha
	Nitrogen Use	166	166	166	240	285	kg N/ha
	Feed Conversion Efficiency (eaten)	10.6	10.5	10.7	11.0	11.2	kg DM eaten/kg MS
Herd	Cow Numbers (1st July)	565	565	565	640	674	cows
	Peak Cows Milked	552	552	552	624	648	cows
	Days in Milk	271	264	277	270	267	days
	Avg. BCS at calving	4.9	4.9	4.9	4.9	4.9	BCS
	Liveweight	1,663	1,663	1,663	1,780	1,847	kg/ha
Production	Milk Solids total	274,130	268,087	278,084	279,169	283,511	kg
(to Factory)	Milk Solids per ha	1,713	1,676	1,738	1,745	1,772	kg/ha
	Milk Solids per cow	497	486	504	447	438	kg/cow
	Peak Milk Solids production	2.23	2.23	2.23	2.05	2.03	kg/cow/day
	Milk Solids as % of live weight	103.0	100.7	104.5	98.0	95.9	%
Feeding	Pasture Eaten per cow *	4.4	4.4	4.4	4.0	3.9	t DM/cow
	Supplements Eaten per cow *	0.2	0.1	0.3	0.2	0.3	t DM/cow
	Off-farm Grazing Eaten per cow *	0.7	0.7	0.7	0.7	0.7	t DM/cow
	Total Feed Eaten per cow *	5.3	5.1	5.4	4.9	4.9	t DM/cow
Diagnostics	Pasture Eaten per ha	15.2	15.1	15.2	15.8	16.2	t DM/ha
	Supplements Eaten per ha	1.0	0.5	1.3	1.3	1.5	t DM/ha
	Off-farm Grazing Eaten per ha	4.3	4.3	4.3	4.8	4.9	t DM/ha
	Total Feed Eaten per ha	20.5	19.9	20.8	21.9	22.5	t DM/ha
	Supplements and Grazing / Feed Eaten *	17.1	14.7	18.3	18.6	19.4	%
	Bought Feed / Feed Eaten *	6.0	3.9	7.5	7.6	8.8	%

(*) feed eaten by females > 20 months old / peak cows milked

- Reducing Autumn supplement and earlier culling reduced production
- Increasing Autumn supplement and delaying culling increased production
- Similar total production from the higher stocked / lower per-cow model but more Nitrogen required to achieve this with similar per-cow supplement feeding

FARMAX YOUR ADVANTAGE Dairy 7.1.2.41

Compare Forecast Profit and Loss

Jun 18 - May 19

			LUDF DSM 201819 Rev Apr	LUDF DSM 201819 No Aut Suppl	LUDF DSM 201819 Hi Suppl	LUDF DSM 201819 High Stock Mid Cow	LUDF DSM Baseline
Revenue	Stock	Net Milk Sales - this season	1,580,633	1,545,790	1,603,431	1,609,689	1,634,726
		Net Milk Sales - last season	0	0	0	0	0
		Net Milk Sales - dividend	0	0	0	0	0
		Net Livestock Sales	89,167	89,129	88,138	75,920	75,161
		Contract Grazing	0	0	0	0	0
		Change in Livestock Value	0	0	0	0	0
		Total	**1,669,801**	**1,634,919**	**1,691,568**	**1,685,608**	**1,709,887**
	Crop & Feed	Capital Value Change	835	7,400	1,494	0	533
		Total	835	7,400	1,494	0	533
	Total Revenue		**1,670,636**	**1,642,320**	**1,693,062**	**1,685,608**	**1,710,420**
Expenses	Wages	Wages	156,216	156,216	156,216	156,216	156,216
		Management Wage	30,912	30,912	30,912	30,912	30,912
	Stock	Animal Health	66,240	66,240	66,240	74,880	77,760
		Breeding	28,152	28,152	28,152	31,824	33,048
		Farm Dairy	13,800	13,800	13,800	15,600	16,200
		Electricity	20,976	20,976	20,976	23,712	24,624
	Feed/Crop	Pasture Conserved	2,880	2,880	2,880	4,320	2,592
		Feed Crop	3,780	3,780	3,780	3,780	3,780
		Bought Feed	33,435	3,983	54,972	57,579	75,675
		Calf Feed	3,514	3,514	3,514	4,263	4,267
	Grazing	Grazing	258,779	258,779	258,779	285,517	292,789
	Other Farm Working	Fertiliser (Excl. N)	30,880	30,880	30,880	30,880	30,880
		Nitrogen	38,209	38,209	38,209	55,244	65,597
		Irrigation	64,000	64,000	64,000	64,000	64,000
		Weed & Pest Control	3,840	3,840	3,840	3,840	3,840
		Vehicle Expenses	27,048	27,048	27,048	30,576	31,752
		R&M Land/Buildings	52,800	52,800	52,800	52,800	52,800
		Freight & Cartage	1,600	1,600	1,600	1,600	1,600
	Overheads	Administration Expenses	22,400	22,400	22,400	22,400	22,400
		Insurance	16,000	16,000	16,000	16,000	16,000
		ACC Levies	4,800	4,800	4,800	4,800	4,800
		Rates	9,600	9,600	9,600	9,600	9,600
	Total Farm Working Expenses		**889,861**	**860,409**	**911,398**	**980,343**	**1,021,131**
	Depreciation		0	0	0	0	0
	Total Farm Expenses		**889,861**	**860,409**	**911,398**	**980,343**	**1,021,131**
Economic Farm Surplus (EFS)			**780,775**	**781,911**	**781,664**	**705,265**	**689,289**
Farm Profit before Tax			**780,775**	**781,911**	**781,664**	**705,265**	**689,289**
Farm Profit per ha before Tax			**4,880**	**4,887**	**4,885**	**4,408**	**4,308**

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.

EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

- Virtually no difference in profitability for current versus revised management tweaks

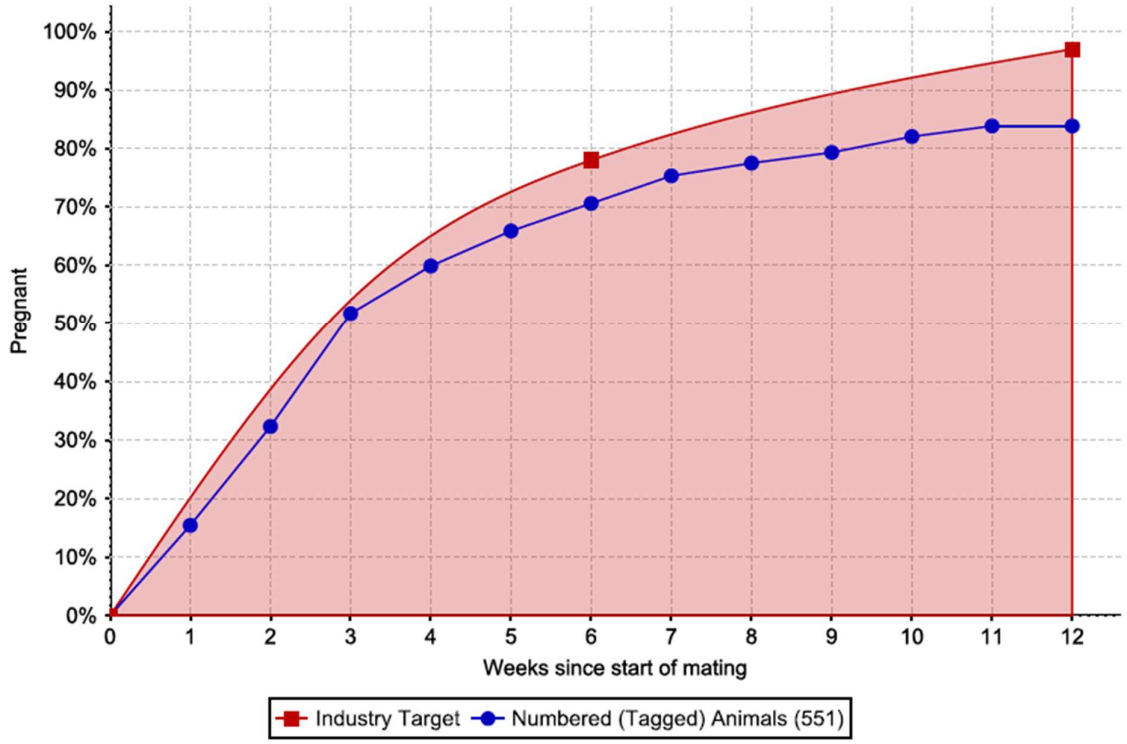
MATING UPDATE

infovet LINCOLN UNIVERSITY DAIRY FARM Report Date: 07/02/2020

Pregnancy Rate

Planned start of Mating: 18/10/2019

Season: 2019



For those groups that are "at PSM" the report includes all animals present at PSM, even if they have since left the group, died, or been sold or culled.
Excluded are animals that had already died, or been sold or culled before PSM.

Graph shows pregnant cows with a conception date prior to 12 weeks after PSM.

infovet Report Date: 07/02/2020

Pregnancy Rate

Planned start of Mating: 18/10/2019

Season: 2019

Numbered (Tagged) Animals

Conception Date	Number	Percentage
Graphed:		
Before PSM	0	0%
Before 1 week after PSM	85	15%
Before 2 weeks after PSM	178	32%
Before 3 weeks after PSM	285	52%
Before 4 weeks after PSM	330	60%
Before 5 weeks after PSM	363	66%
Before 6 weeks after PSM	389	71%
Before 7 weeks after PSM	415	75%
Before 8 weeks after PSM	427	77%
Before 9 weeks after PSM	437	79%
Before 10 weeks after PSM	452	82%
Before 11 weeks after PSM	462	84%
Before 12 weeks after PSM	462	84%
Not Graphed:		
12 or more weeks after PSM	0	0%
Pregnant but foetal age not given	0	0%
Recheck	1	0%
Empty	86	16%
Not tested	2	0%
	551	100%

Fertility Focus 2019: Seasonal

LINCOLN UNIVERSITY DAIRY FARM
PO Box 85094
LINCOLN UNIVERSITY
7647

Report date:	07/02/20
PTPT:	BQCY
Herd Code:	6/114
No of cows included:	555
These cows calved between:	10/06/19 and 16/12/19
Mating start & end date: (based on AB or pregnancy test data)	18/10/19 - 31/12/19
Next planned start of calving:	26/07/20
Duration of mating:	75 days
Duration of AB period:	75 days

incalf FERTILITY FOCUS Version 3.01

DairyNZ

infovet

1 Overall herd reproductive performance

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

Your herd	70% (70-71%)
Aim above	78%

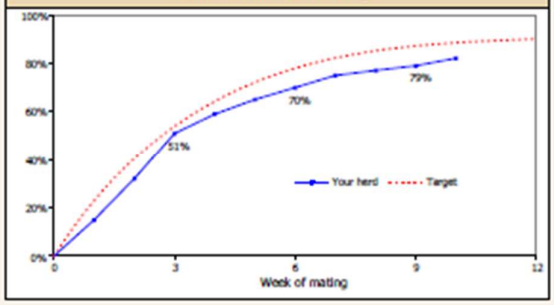
☆☆☆

Not-in-calf rate
Percentage of cows not pregnant after 75 days of mating

Your herd	17% (16-17%)
Aim for	11%

☆

% of herd in calf
Cumulative by week of mating



2 Drivers of the 6-week in-calf rate

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

Your herd	89%
Aim above	90%

☆☆☆☆☆

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

Your herd	
Aim above	

Conception rate
% of inseminations that resulted in a confirmed pregnancy

Your herd	50%
Aim above	60%

☆

3 Key indicators to areas for improvement

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

Calved by	Week 3	Week 6
Your herd	80%	92%
Aim above	80%	95%
	☆☆☆☆☆	☆

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

Calved by	Week 3	Week 6	Week 9
Your herd	71%	95%	100%
Aim above	67%	88%	98%
	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆

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

Your herd	83%
Aim above	85%

☆☆☆☆☆

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

Your herd	92%
Aim above	90%

☆☆☆☆☆

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

Your herd	91%
Aim above	95%

☆☆☆

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

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

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

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

Not-in-calf rate

Your herd	17%
Expected	17%

OK

Behind Your Detailed Fertility Focus Report

incalf FERTILITY FOCUS Version 3.01

DairyNZ

infovet

Report period: Cows calved between 10/06/19 and 16/12/19.
This was the most recent period with sufficient herd records that enabled an analysis to be completed.

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

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

Report date:	07/02/20
PTPT:	BQCY
Herd Code:	6/114
Calvings up to this date requested for analysis:	08/02/20
No of cows included:	555
These cows calved between:	10/06/19 and 16/12/19
Mating start & end date: (based on AB or pregnancy test data)	18/10/19 - 31/12/19

Part A) Herd records cross check

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

2019/20	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
No. of calvings		173	342	56									571
No. of AB matings					351	399	176						926
No. of preg tests								549	133				682
No. of non-aged/late aged positive preg tests													0
No. of cows culled or died		1	10	6	1	2		3					23

Part B) Notes on the calculations

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

1 Overall herd reproductive performance

6-week in-calf rate

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

Records available for not-in-calf rate

Recorded pregnant	462
Recorded empty	86
Doubtful/recheck*	1
Culled without pregnancy test	5
No record of cull or pregnancy test	1
Cows analysed	555

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

2 Drivers of the 6-week in-calf rate

3-week submission rate

555 cows had calving dates in the required range and were not culled before day 21 of mating and 89% of these were submitted during the first 21 days of mating.

Non-return rate

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

Conception rate

The conception rate was calculated for 909 AB inseminations on and between 18.10.19 and 31.12.19.

3 Key indicators to areas for improvement

Calving pattern of first calvers

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

Calving pattern of whole herd

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

3-week submission rate of first calvers

101 first calvers had calving dates in the required range and were not culled before day 21 of mating and 92% of these were submitted during the first 21 days of mating.

Heat detection

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

Pre-mating heats

555 cows had calving dates in the required range and were not culled before day 21 of mating and 460 of these had a pre-mating heat recorded.

Non-cycling cows

No cows were identified as being treated for non-cycling. If you did treat non-cycling cows, please supply records to ensure those cows are identified.

Performance after week 6

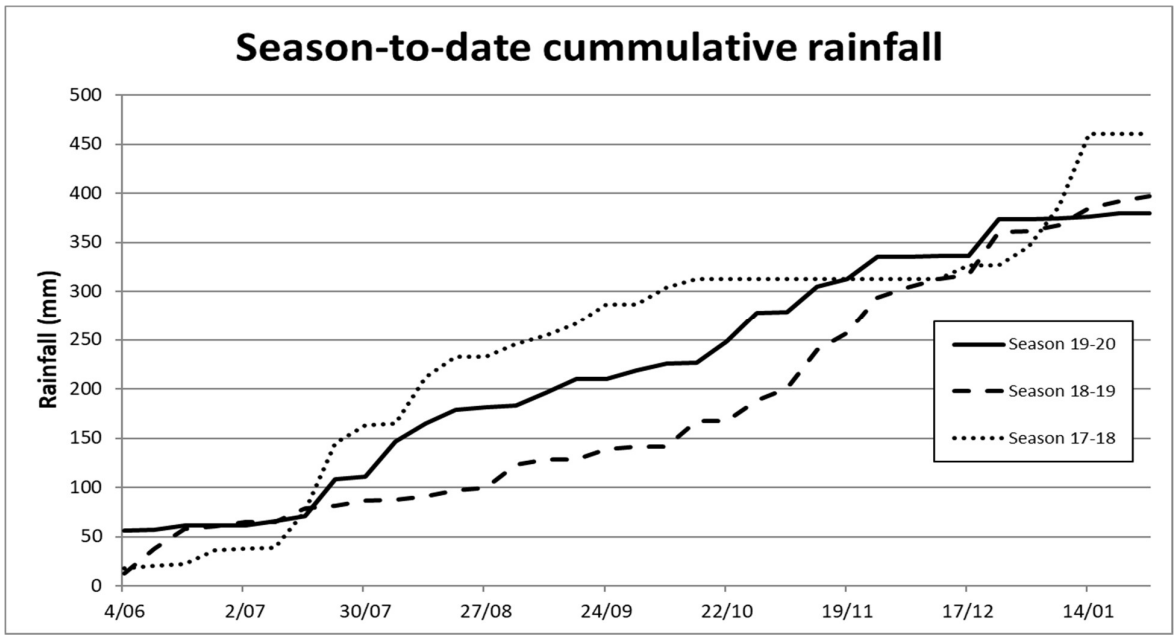
Your herd's not-in-calf rate and 6-week in-calf rate were used to determine the success of your herd's mating program after the first six weeks. If bulls were used after week 6 of mating, this gives an assessment of how well they got cows in calf.

Induced cows

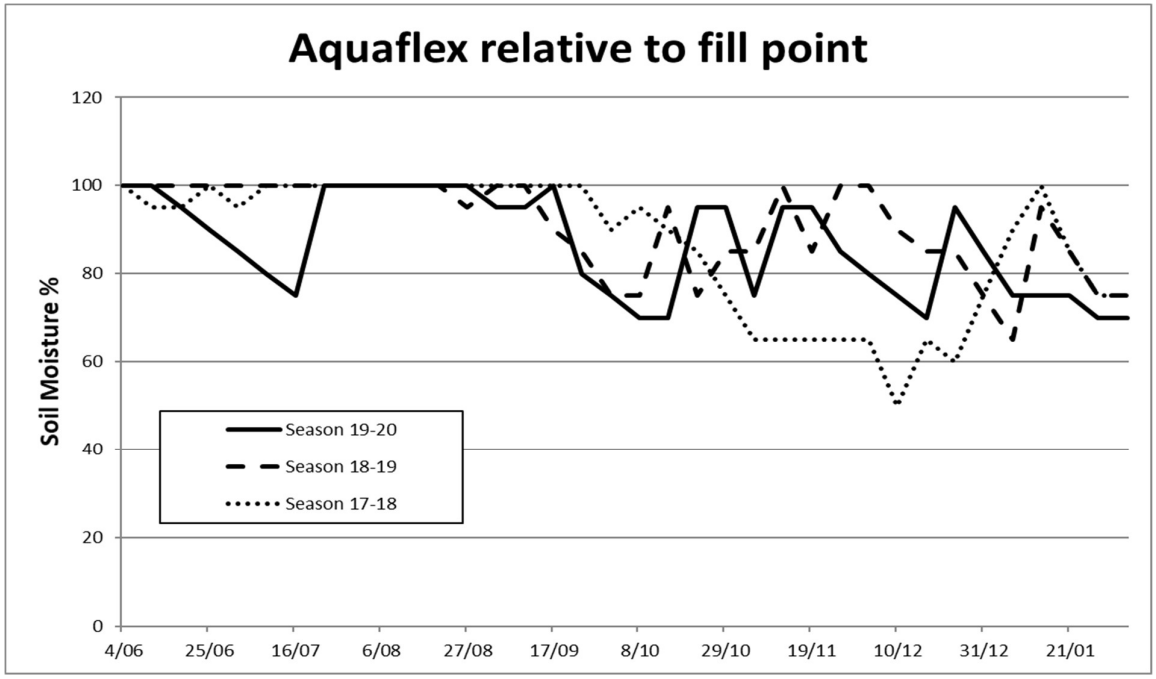
No cows were identified as having induced calvings. If cows were induced, ensure all inductions are recorded.

LUDF – OVERVIEW OF SEASON TO DATE

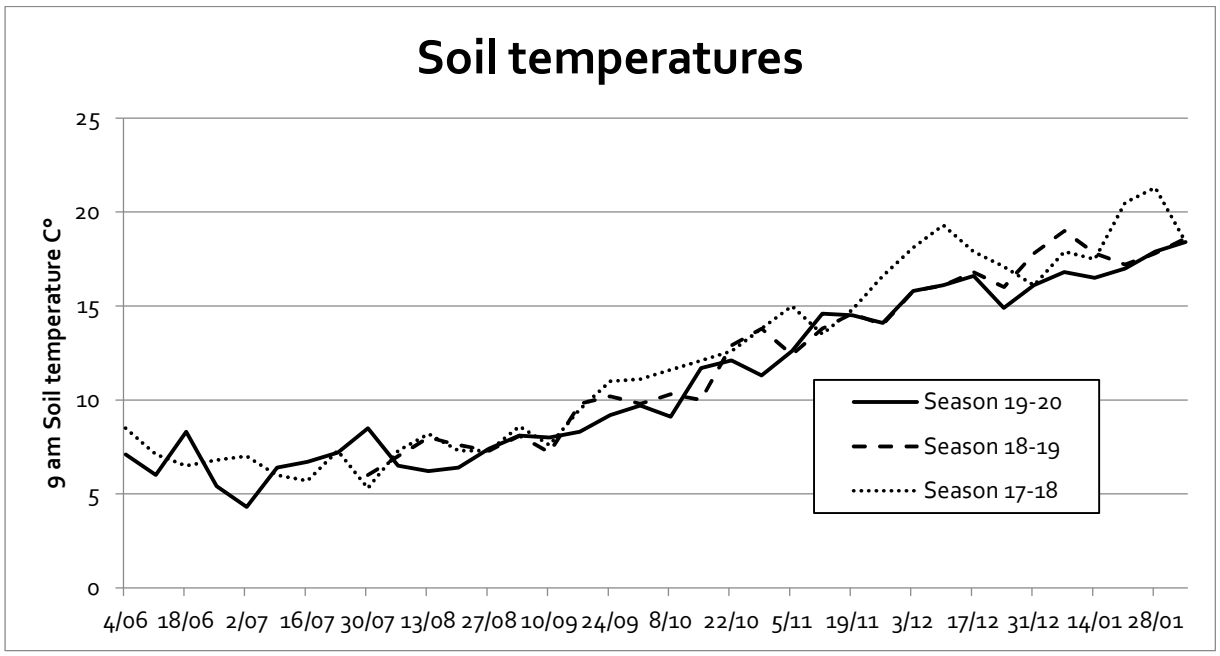
The graphs below show the weather conditions from the start of the 2019-20 season till now. Since the last focus day LUDF has received 161 mm of rain. January has been quite dry, with only 5 mm of rain received and there has been no rainfall the past three weeks.



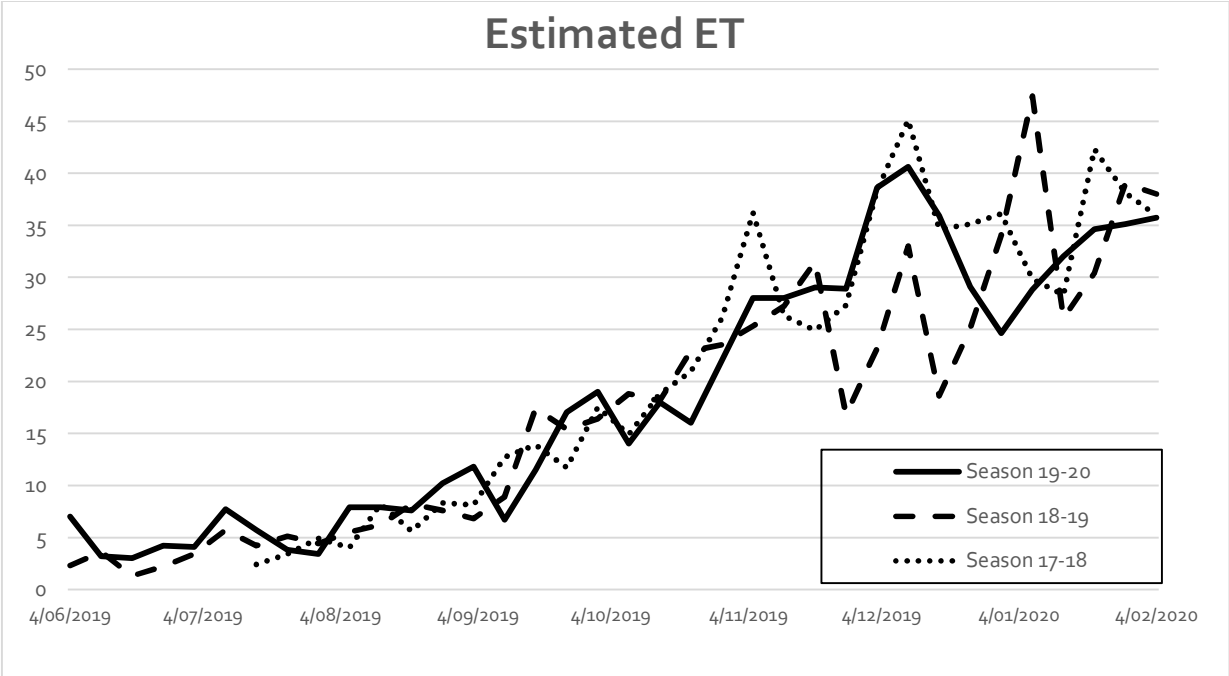
The resulting water logging on the platform has meant the farm remained over 100% for about a month in August and not far off it during September. Since then things have dried out a bit and soil moisture has not reached 100% field capacity as it did in the 2018-19 season. It has been drier than usual the last month.



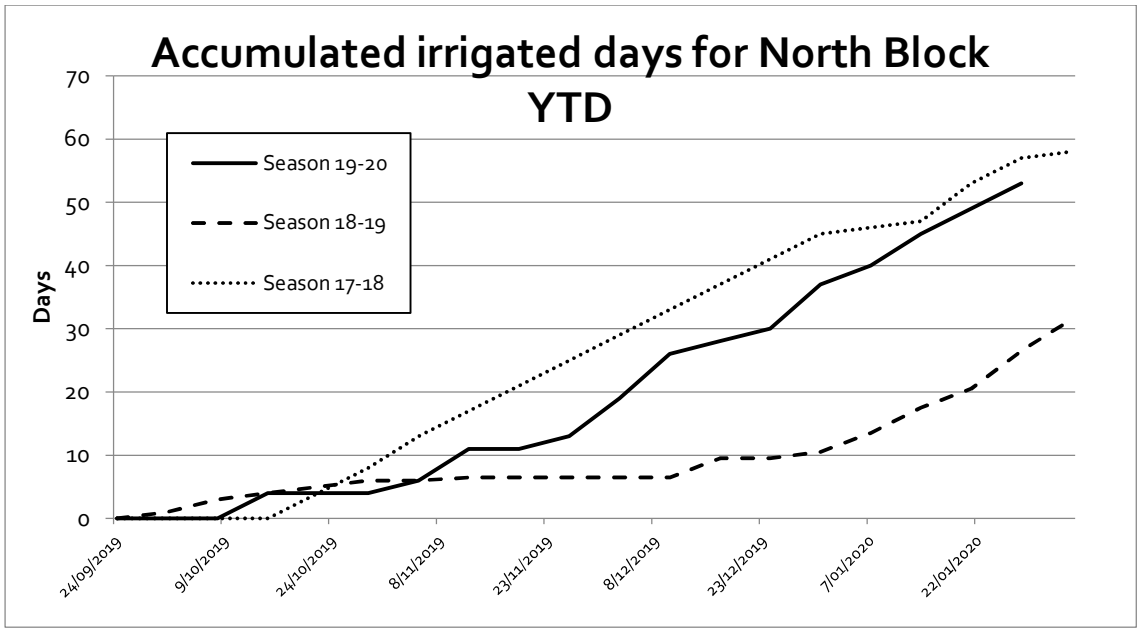
The graph below shows that soil temperatures have hovered around the same levels as previous season. December and January were a bit colder than usual and that is reflected in the soil temperatures.



ET has remained at roughly the same levels as previous season's levels, with a decrease seen in late December/early January. The smoke from the Australian Wildfires would have impacted ET during this period.



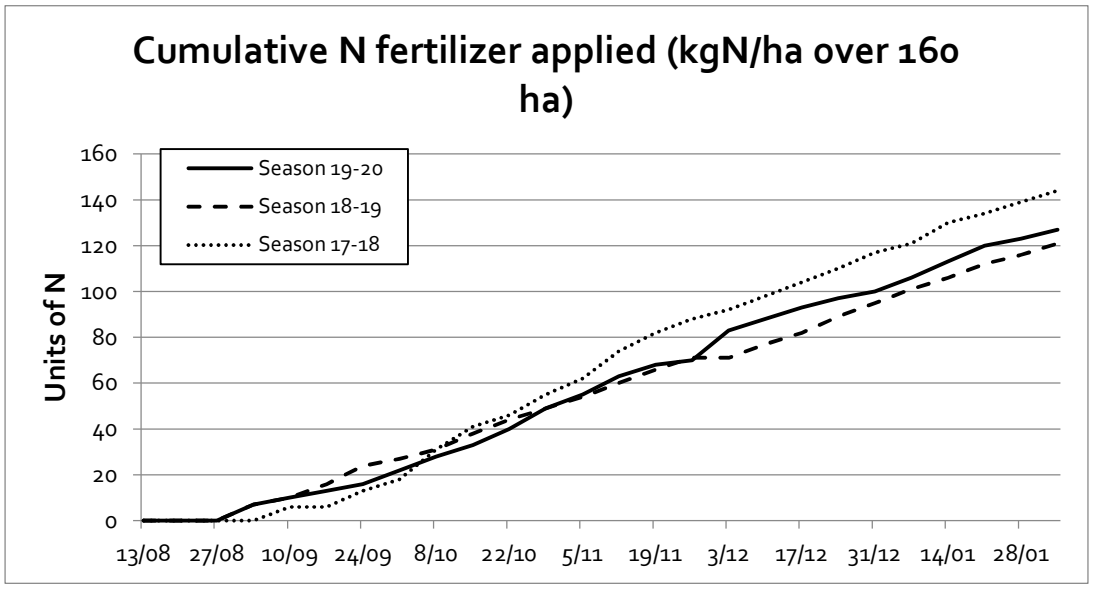
Irrigation has been slightly below 2017-18 levels for most of the season but are at similar points now in February. The 2018-19 season was quite below current levels as there were not long periods of dry weather as seen in the 2017-18 and 2019-20 season, meaning irrigation frequency was able to be reduced.



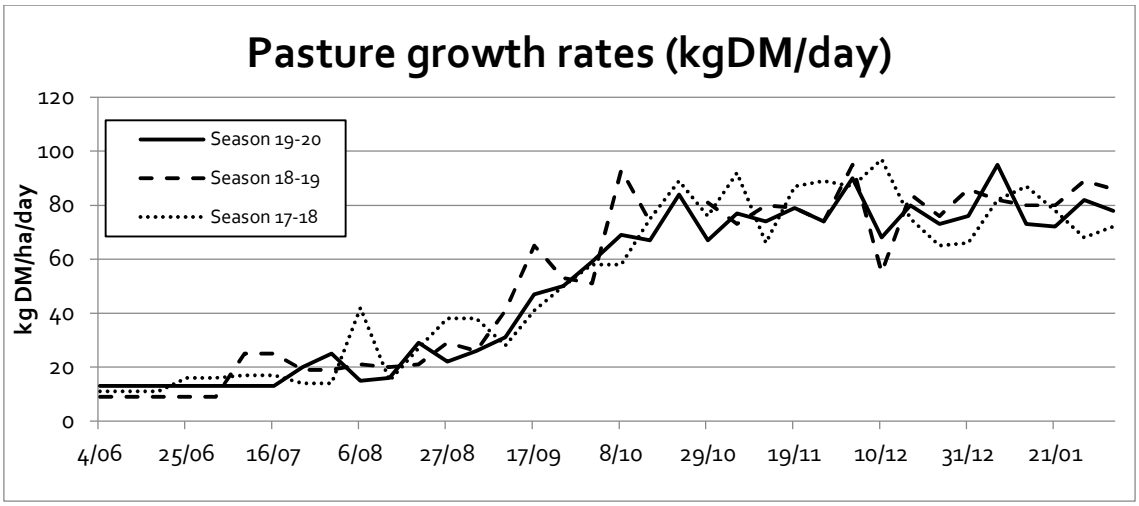
Fertiliser and growth

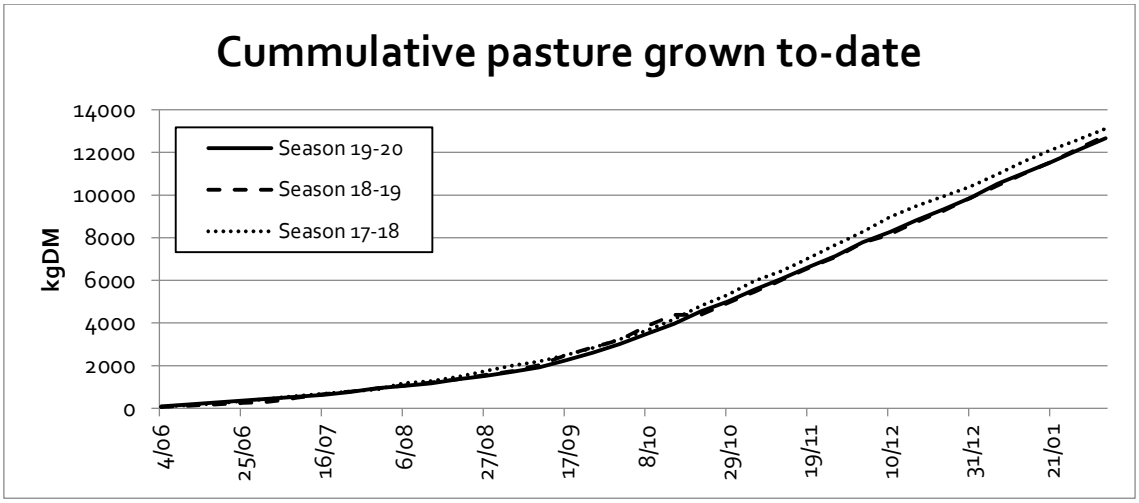
LUDF starts the fertilizer application season when soil temperatures and ground conditions allow for good responses. The first round of fertilizer is always in the form of AMMO to ensure good sulphur level in the ground for the rest of the season.

Fertiliser application rates are just slightly higher than the 18-19 season, but below that of 17-18.



Pasture growth rates have varied through the season, being both below and above previous seasons daily growth rates. Cumulative pasture growth has been on par with the 2018-19 season, both of which were below that of the 2017-18 season.

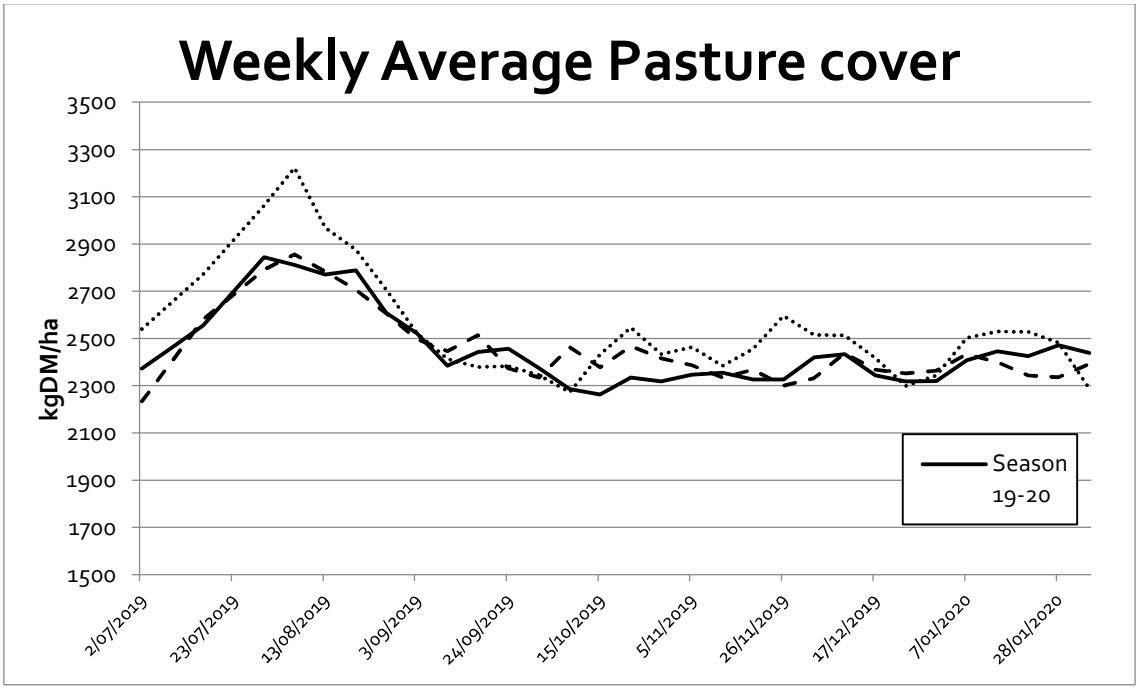




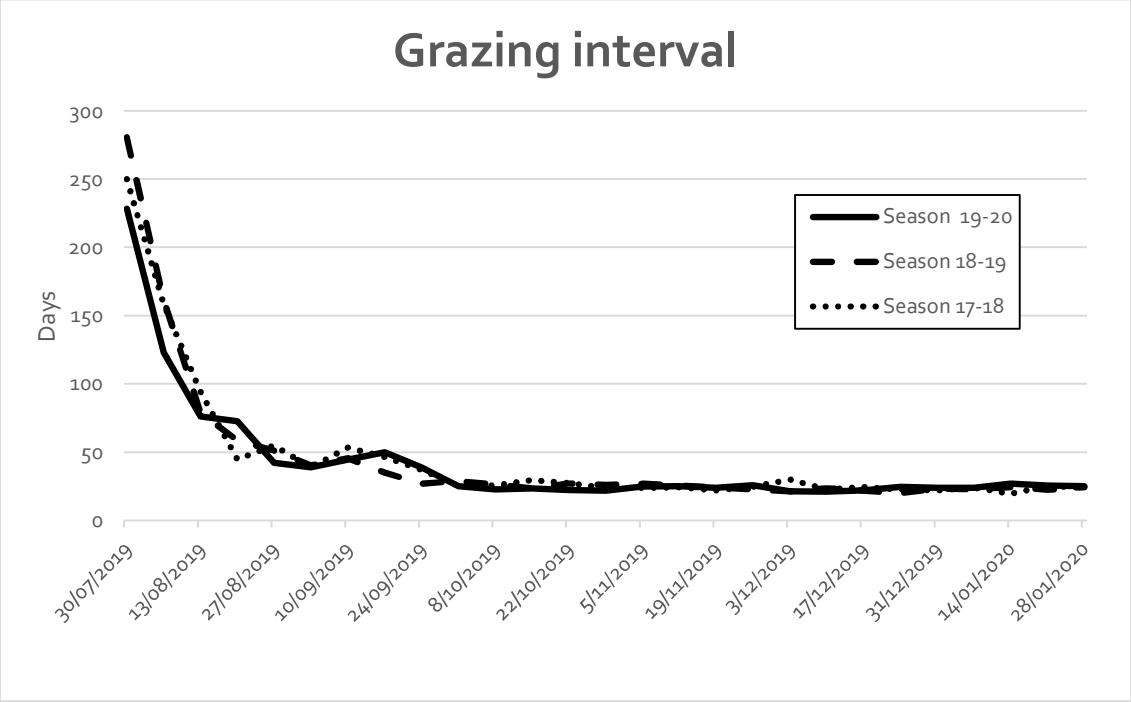
Feed Management

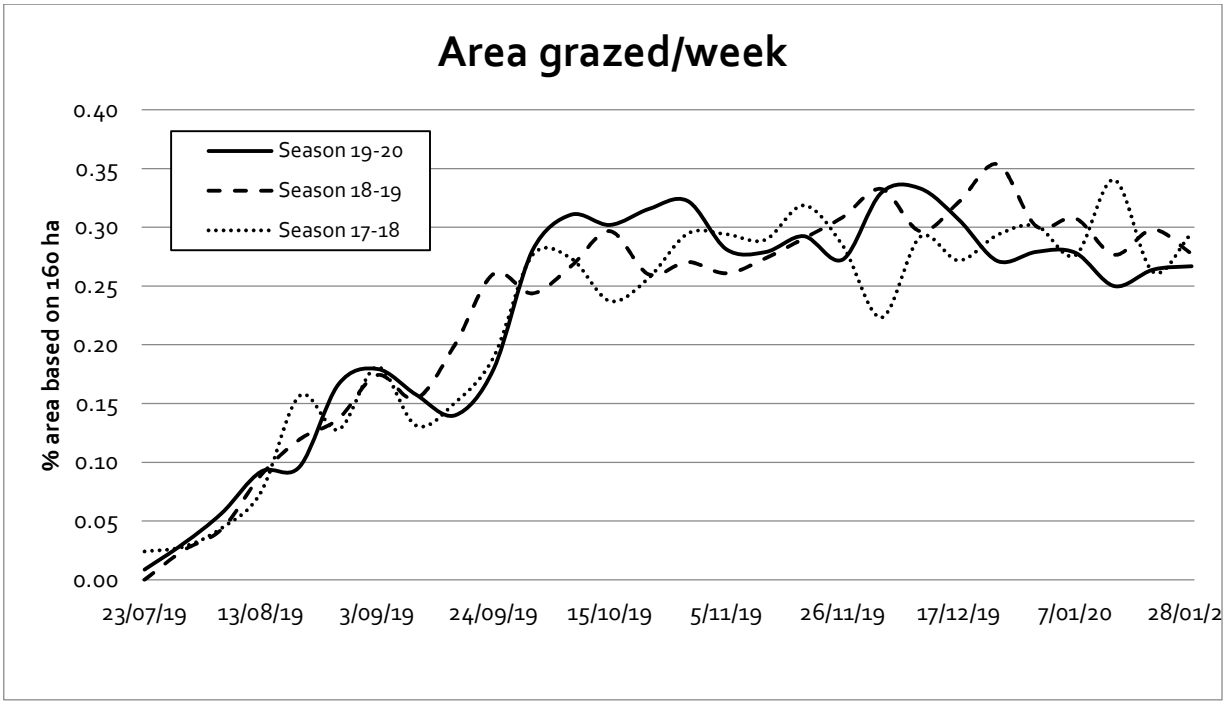
LUDF walks the farm every Tuesday, measuring pasture yield data in every paddock using a rising plate meter.

Comparing this data with the previous week's data enable growth rates to be calculated and a comparison made of changes in average pasture cover.

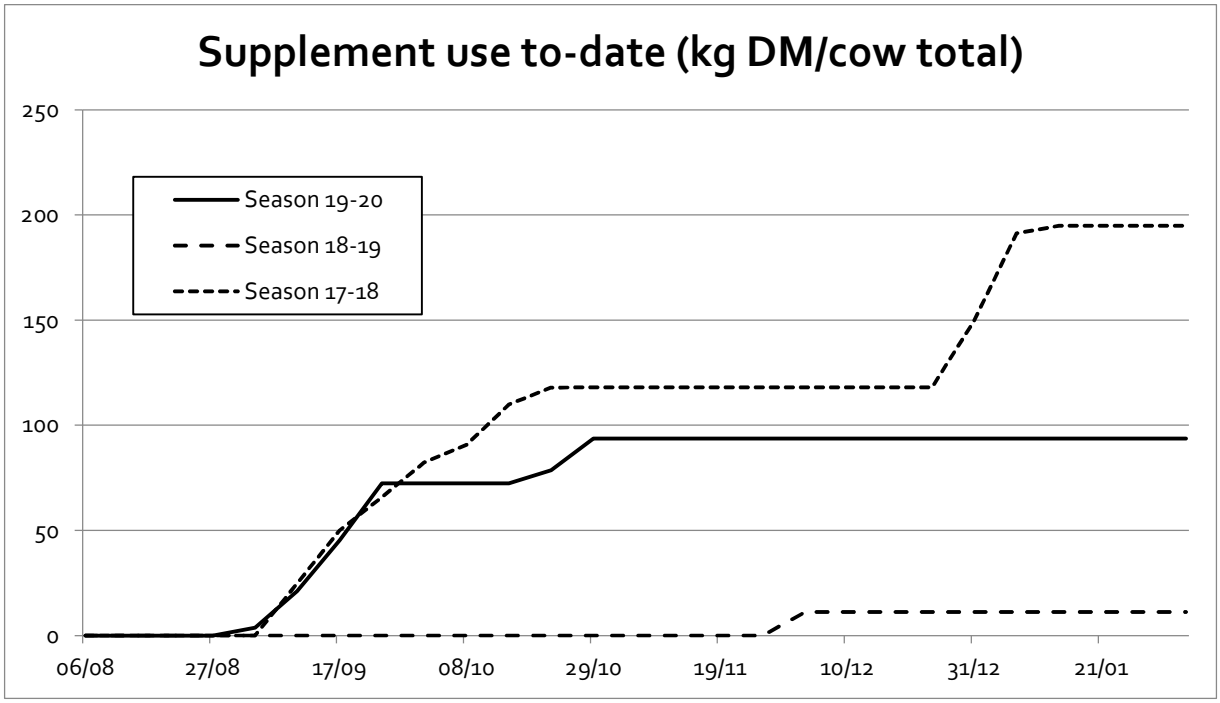


The Grazing Interval has been consistent with previous seasons, with the past three weeks having a round length of 25 days.

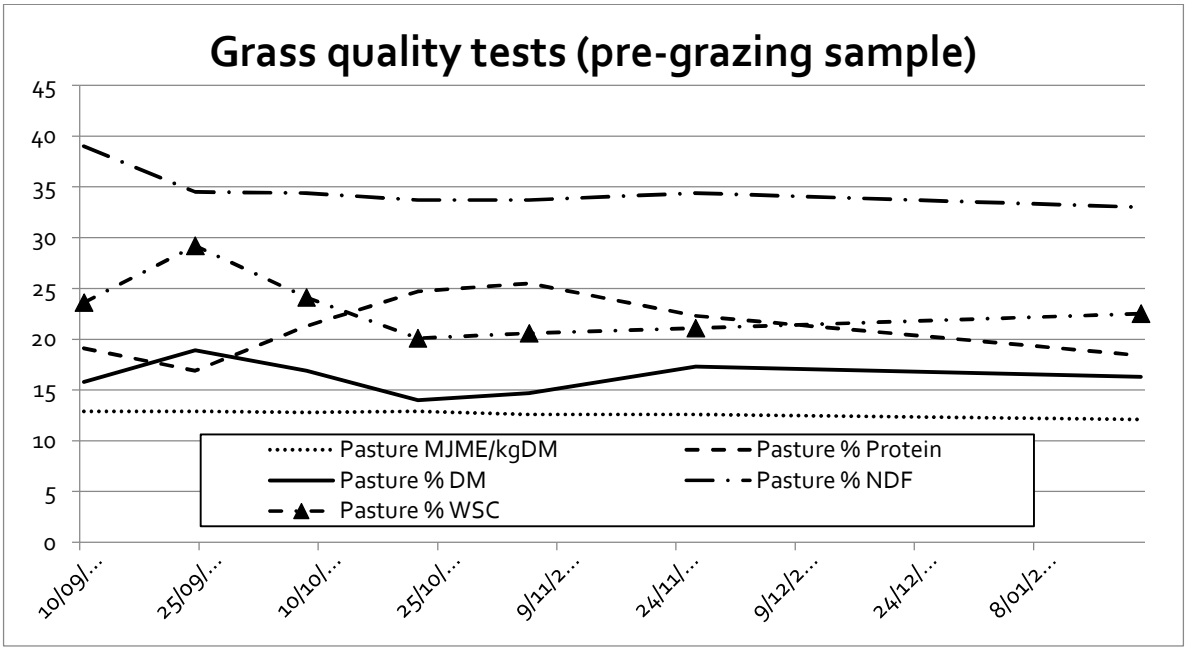




The combination of opening areas under wet conditions. and slower growth rates than in 18-19, meant that supplements had to be started by end August to support increasing demand as cows continued to calve as well as increased demand by the milking herd. 93.7 TDM of silage had been fed by the 22nd of October and no other supplements have been fed since this date. Supplement use to date is below that of the 2017-18 season, but well above that of the 2018-19 season. Most of the 2018-19 season silage was fed out in the autumn, whereas the wet start to this season made it necessary to feed silage out in the spring in order to maintain round length.

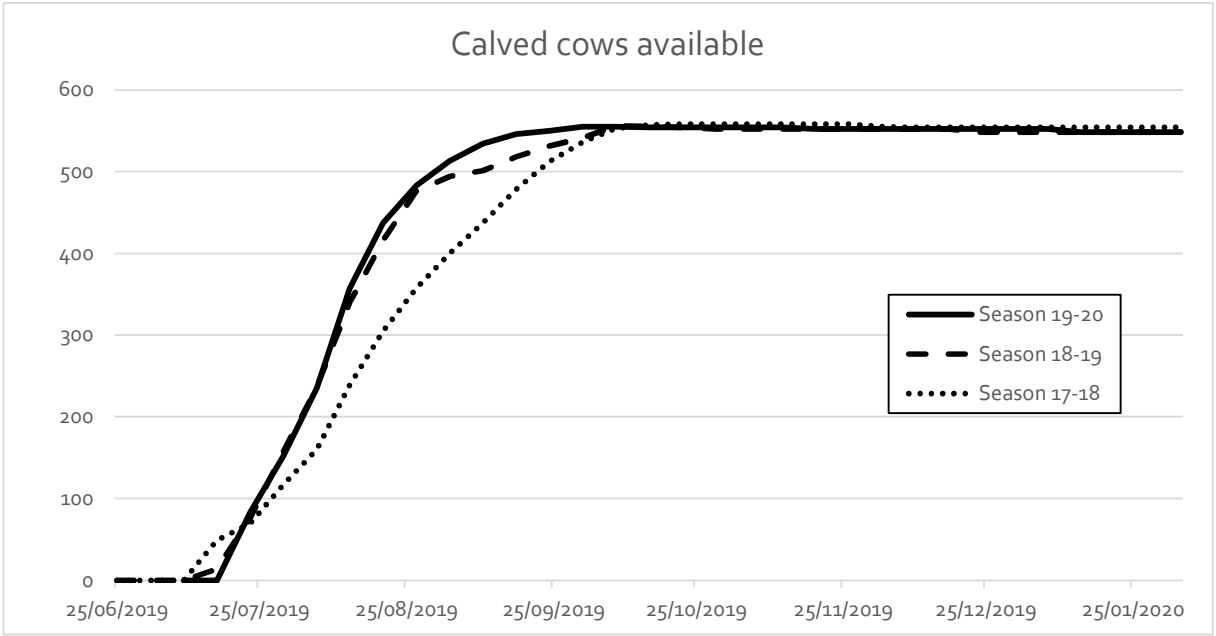


Below are the Pasture Quality graphs showing the trends of DM%, ME, Protein%, NDF % and Water Soluble Carbohydrates (%) of pasture samples taken since the start of the season.

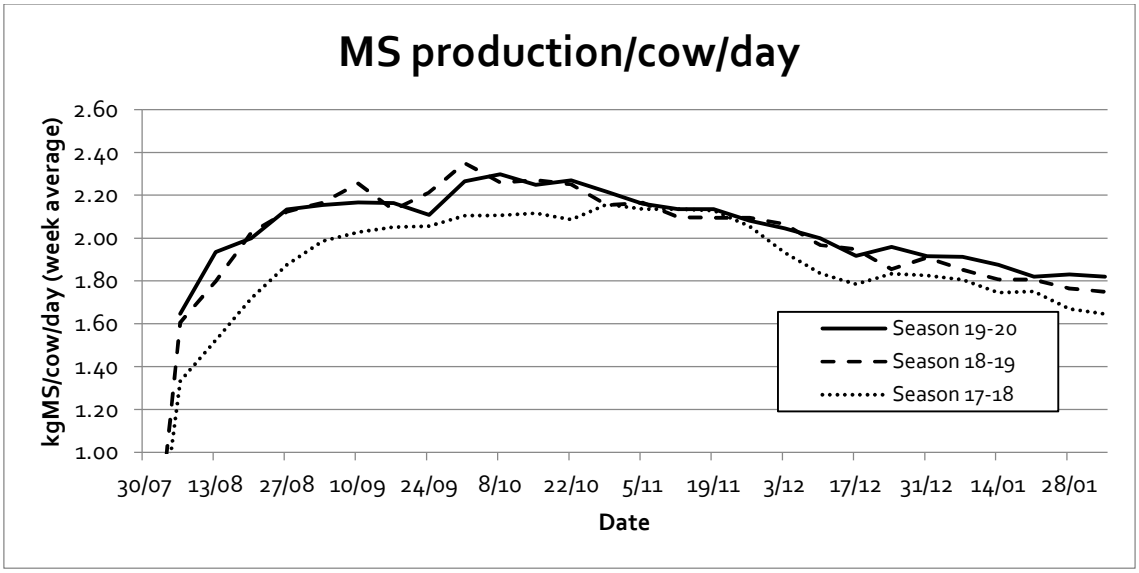


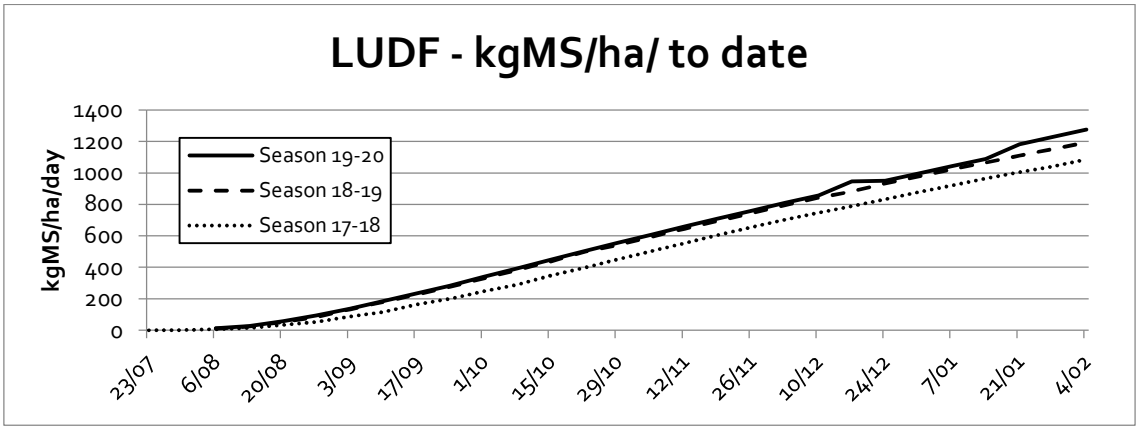
Production

As calving occurred roughly at the same time & speed as last season, the lactation curve remains similar to that of 18-19 season. The calving pattern during the second 3 weeks of calving improved from last season. This is seen below by the higher numbers of cows calved from mid-August onwards when compared with last season.



The graphs below show the performance on a per cow and per hectare basis. Having more cows calving early has meant a slightly higher production/ha and production per cow when compared with 18-19 season.

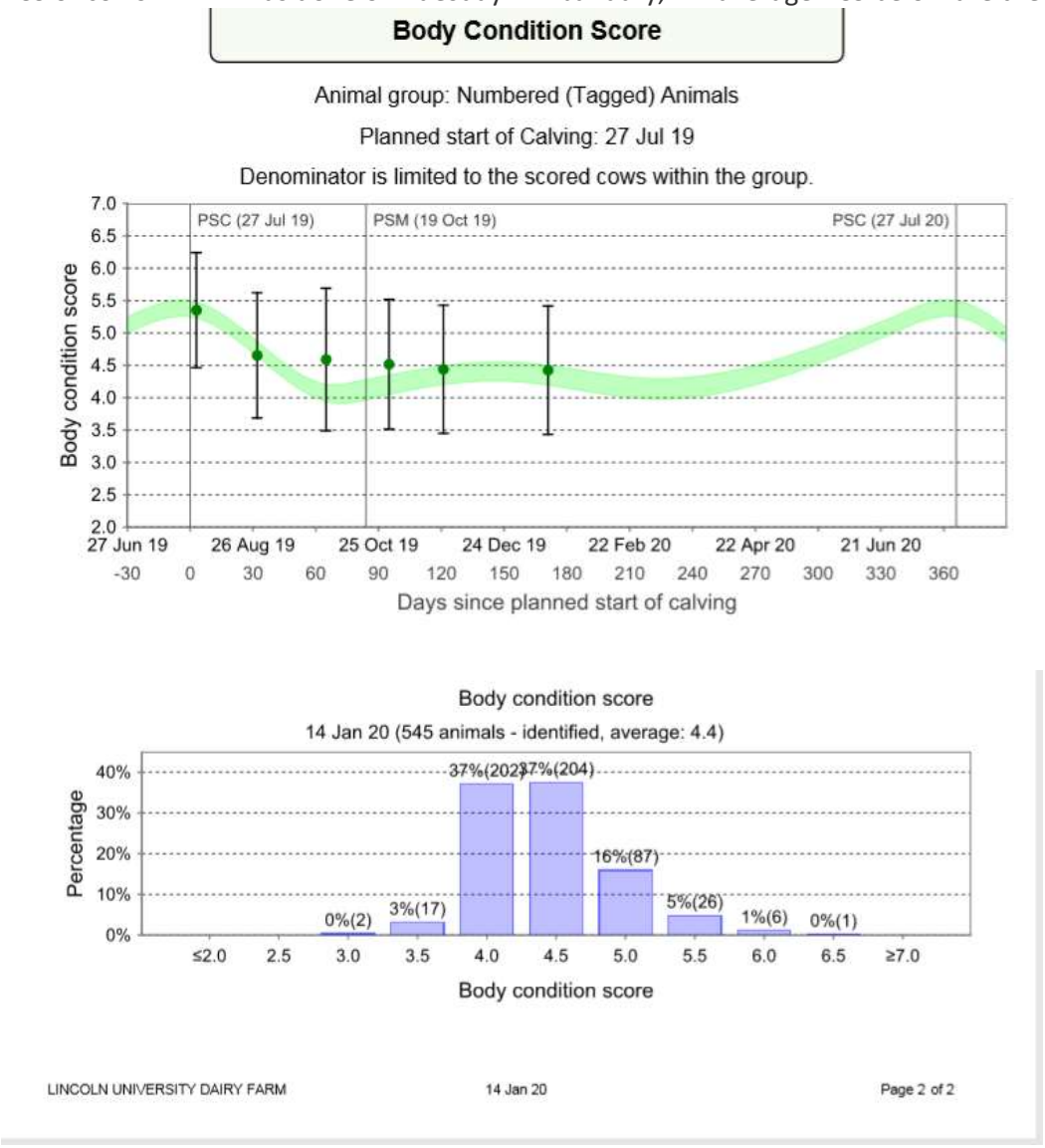




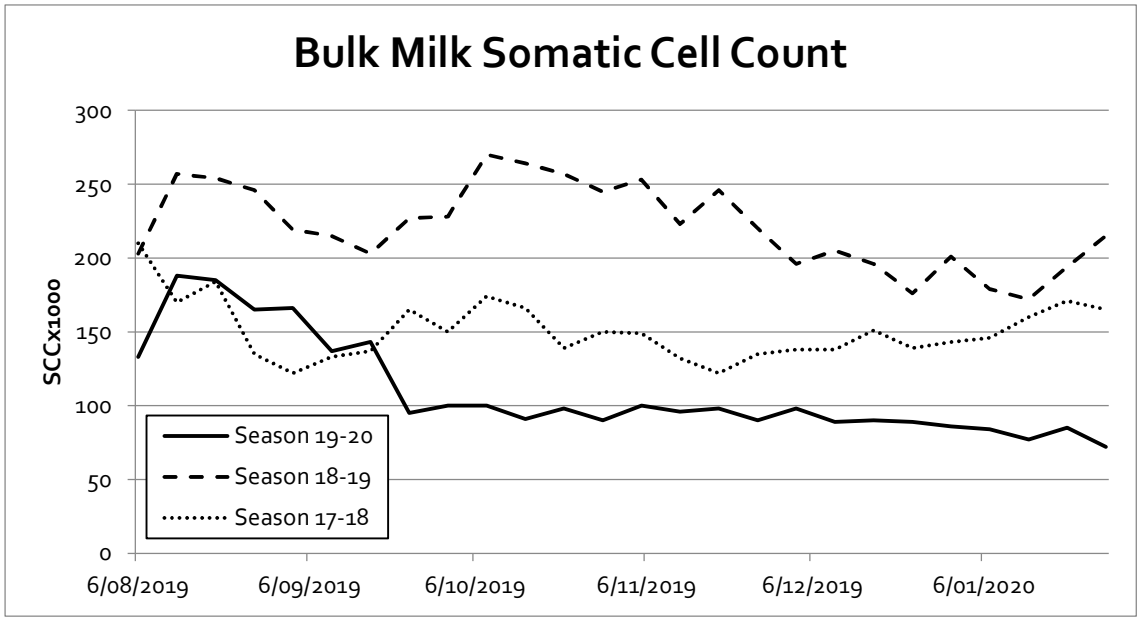
Animal Health

The graphs below show the relevant information regarding BCS and herd health.

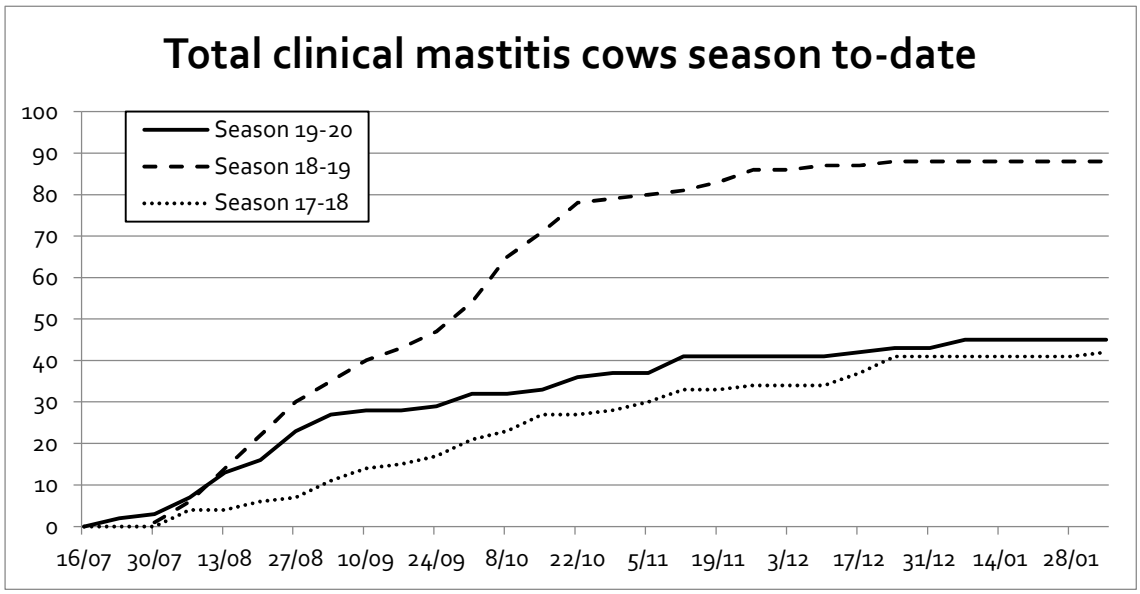
BCS of cows in milk was done on Tuesday 14th January, 4.4 average BCS below are the graphs.



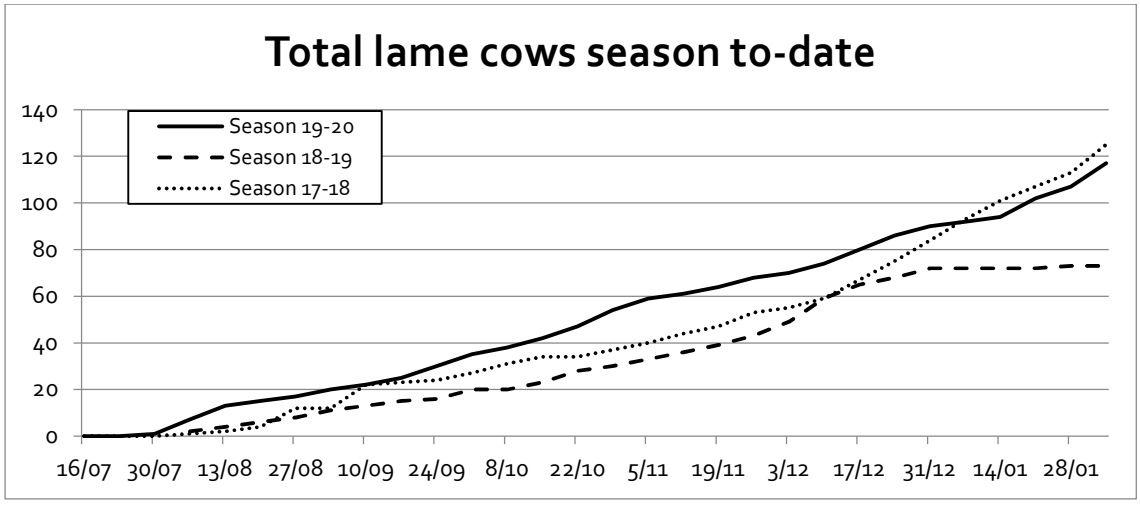
The following graphs show the levels of udder and feet health achieved in the herd season to-date, compared to previous seasons.



Bulk milk SCC has remained under 18-19 season's levels all the way through calving, dropping to the lowest it has been in the last 3 years from mid-September. Target is to have an average below 150.



Total clinical mastitis for the 2019-20 season is almost half of what is was this time last season.



Wet conditions at the beginning of the season led to a high level of cumulative lame cows compared to the previous two seasons, but now numbers are less than that of the 2017-18 season.

PASTURE ASSESSMENT PROGRAM

Lincoln University Dairy Farm (LUDF) is trialling 3 different pasture assessment tools to demonstrate to farmers options available to them to monitor and manage pasture.

Key Contributors:

- **LUDF**, Platemeter assessments + Pasture Coach
- **C-DAX,** Robotic assessment
- **LIC SPACE,** Satellite assessment

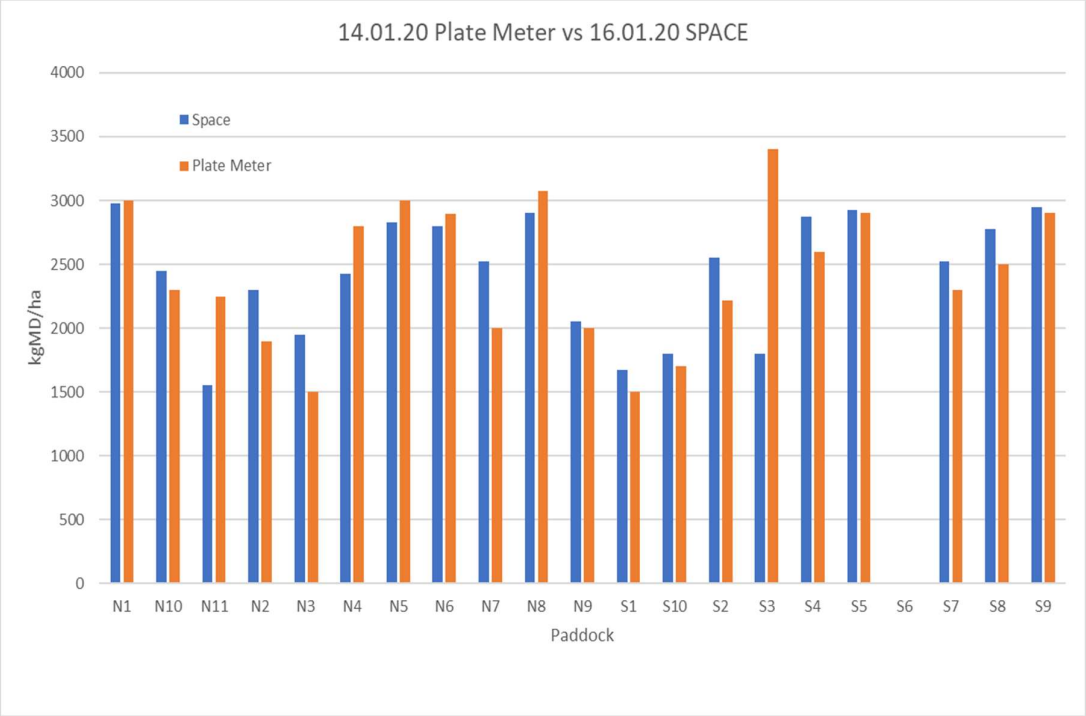
The C-DAX robot has yet to complete a full pasture assessment on LUDF, so only SPACE and the Plate Meter have been compared at this point.

We are walking the farm every Tuesday morning with the Plate Meter and are using the results to produce weekly feed wedges using Pasture Coach pasture management software.

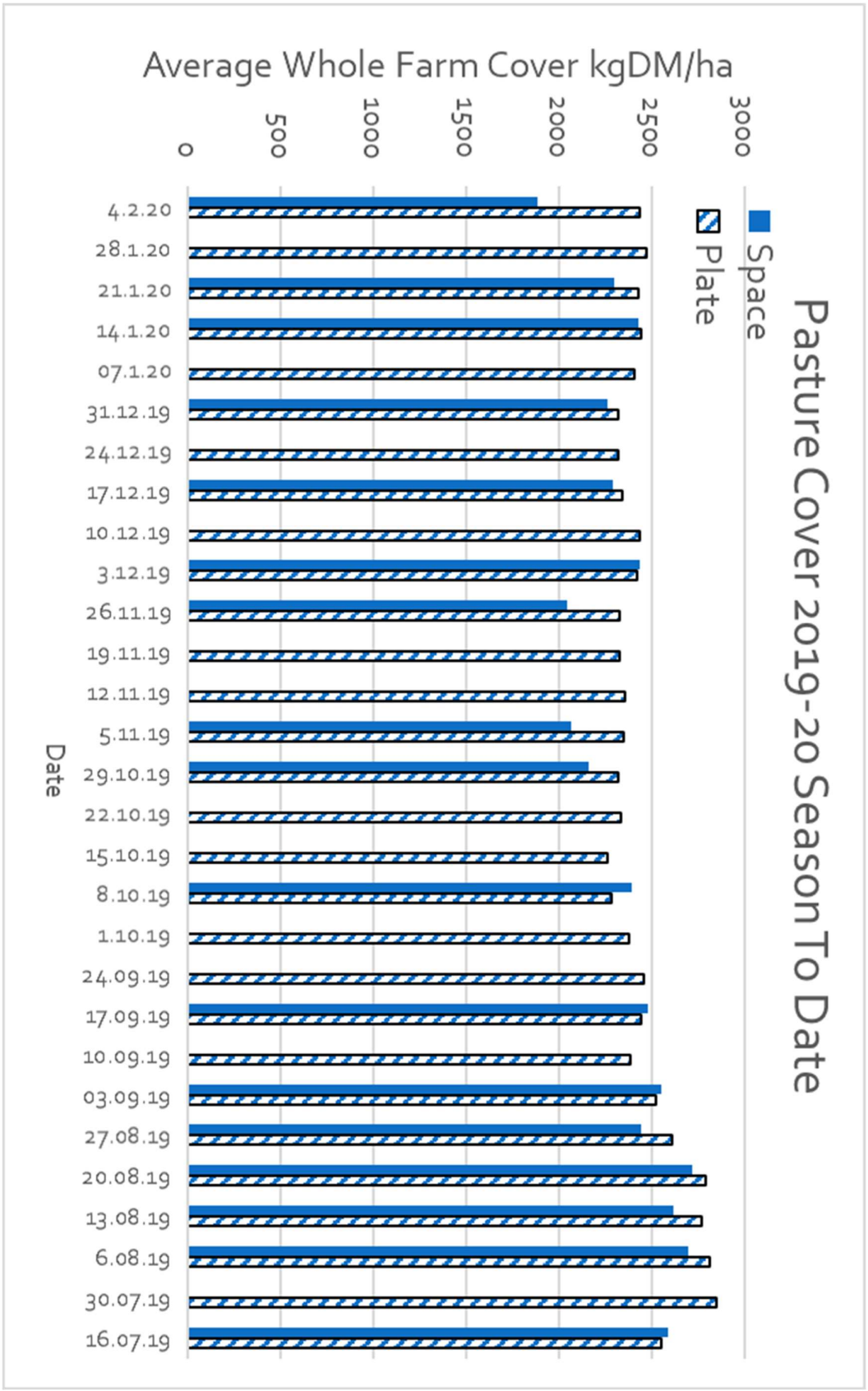
SPACE has proven challenging, as it does not fly over the farm at a consistent interval. As you can see from the second graph, SPACE has missed many readings throughout the season. When we do receive them, they are often many days after our pasture walk, so not truly comparable with our farm walk readings either. We have decided to graph SPACE data that is 1 or 2 days out from the pasture walk so that there is at least some data to compare!

SIDDC has been presenting the data on our website in two graphs that are updated regularly, as shown below.

The first graph will have the most recent estimated pasture cover from all three tools, on an individual paddock basis.



The second graph will depict the average weekly pasture cover of the season to date, for all three tools:


Average Whole Farm Cover kgDM/ha
0
500
1000
1500
2000
2500
3000
Space
Plate
Pasture Cover 2019-20 Season To Date
Date
4.2.20
28.1.20
21.1.20
14.1.20
07.1.20
31.12.19
24.12.19
17.12.19
10.12.19
3.12.19
26.11.19
19.11.19
12.11.19
5.11.19
29.10.19
22.10.19
15.10.19
8.10.19
1.10.19
24.09.19
17.09.19
10.09.19
03.09.19
27.08.19
20.08.19
13.08.19
6.08.19
30.07.19
16.07.19

HydroMetrics™

Hydrometric GW50 Groundwater Nitrate Sensor

www.hydrometrics.co.nz

Lincoln University Dairy Farm

Flow Cell for pumped water

In bore cleaning system

- LU Dairy Farm has 2 sites -Upstream and Downstream in terms of Groundwater Flow Direction.
- Recorded every 15 minutes
- Sent to website hourly/daily for easy access.
- Shallow Groundwater (c.7m)
- Regional groundwater average nitrate levels elevated approx. 9 mg/L
- No indication of increased levels at downstream monitoring site
- Nitrates do fluctuate, particularly in shallow groundwater and continuous monitoring insures you can understand the dynamics and obtain more accurate information.

Contact: Dr Blair Miller
General Manager Hydrometrics

Nitrate Sensors for Research, Agriculture and Industry.

P +64 3 325 3700 / E info@hydrometrics.co.nz / W hydrometrics.co.nz
PO Box 69 133 / Lincoln / Christchurch 7674 / New Zealand

HydroMetrics™

Nitrate GW50
Groundwater Optical Nitrate Sensor

Introduction

Many countries around the world are in the process of adopting nitrate caps via land discharge allowances to manage nitrate losses into freshwater bodies and groundwater drinking supplies from agricultural production. One area that remains unclear is how nitrate losses will be reliably measured to monitor and enforce these limits. Current approaches are principally based on modelling, rather than direct measurement of nitrate losses, as options such as regular physical sampling or real-time sensors are too expensive to be scalable. To address this, Lincoln Agritech has developed a low-cost sensor capable of measuring the concentration of nitrates in groundwater via monitoring wells.

General Specifications

- Groundwater deployment to measure nitrate - nitrogen concentrations.
- Deployment in low ionic strength groundwater means organic carbon or chloride interferences are minimal.
- Designed to allow installation in 50 mm wells. These are often able to be installed by low cost direct push technologies, reducing the overall installation cost.
- Remote data-logging capability for real-time data.
- A fit for purpose Nitrate Sensor at a low price point that enables feasible deployment across multiple sites at the catchment or farm scale.
- Low power consumption (solar power installation possible).
- The sensor utilises optical sensor technology to extend the service interval when compared to other lower cost technologies such as Ion Selective Electrodes, which often suffer from significant calibration drift. This makes the HydroMetrics optical sensor more suitable for long term unattended deployment.
- Periodic cleaning rather than calibration required, reducing ongoing maintenance.
- Continuous monitoring as opposed to laboratory analysis is rapidly growing within the agricultural community due to increased data frequency.

Technical Specification

Measurement technology (light source)	Xenon flash
Measurement principle	UV Absorbance
Measurement cell	8 mm tube
Parameter	NO_3-N
Measurement range	0 – 50 mg/L (without measurement cell alteration)
Measurement accuracy	+/- 5% +0.1 mg N/L (against standards)
Turbidity compensation	Yes
Data logger	~ 16 GB internal storage
Measurement interval	≥ 1 min
Housing material	316 stainless steel
Dimensions (ø x L)	42.2 mm x 455 mm
Weight	1.55 kgs
Interface	SDI-12 / RS-232
Power consumption	< 100 mW
Power supply	11.5 – 15.5 V
Guarantee	1 year
Max pressure	2.0 bar as standard

Specifications are subject to change without notification.

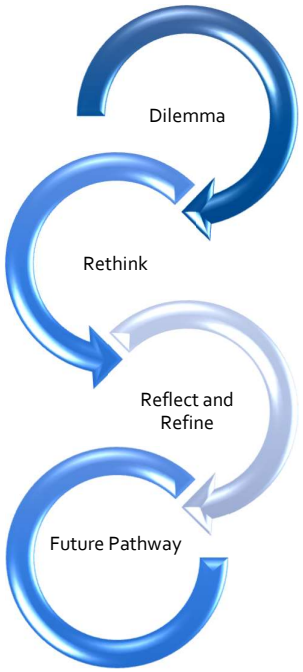
For more information, contact:
Blair Miller – Group Manager,
Environmental Research Lincoln Agritech Ltd
Phone: +64 3 325 3724
Email: blair.miller@lincolnagritech.co.nz
Web: www.lincolnagritech.co.nz

LINCOLN AGRITECH

THE PROCESS FOR POSITIVE CHANGE TO IMPROVE YOUR FARM BUSINESS

Jeremy Savage, *Macfarlane Rural Business*
James McCone, *Dairy Farmer - North Canterbury*

THE PROCESS OF CHANGE FOR FARMING BUSINESS



Dairy Base 2018/19 Results – Canterbury Owner Operator & LUDF

		Canterbury Avg		LUDF	
	Milk Income	$6.48		$6.41	
	Stock / Other Income	$0.33		$0.54	
	Gross Farm Revenue		**$6.81**		**$6.95**
Less					
	Farm Working Expenditure	$4.49		$3.80	
	Depreciation	$0.50		$0.42	
	Farm Operating Expenditure		**$4.99**		**$4.22**
Equals	Operating Profit		$1.82		$2.73
Less	Interest ($22 / kgMS @ 4.5 %)	$0.99		$0.99	
	Drawings / Dividend ($150,000 PA)*	$0.47		$0.55	
	Principal @ 2.6% PA of debt	$0.58		$0.58	
Equals	**Net Cash Profit/ Loss**		**-$0.22**		**$0.61**
Requires					
Break Even Milk Price			**$6.70**		**$5.80**

Key Assumptions:

Dairy Base 2018/19 Owner Operator (52 farms)

2018/19 LIC Statistics 332,500 kgS for average Canterbury farm.

Depreciation = plant replacement + Development, $0.50 = $161,000.

Average debt at $22 / kgMS, interest at 4.5 %. (Margins for highly geared farmers are becoming higher). Debt based on NZ average estimate.

The Dilemma for Canterbury Dairy Farms:

- The Average Farm requires a pay-out of $6.70 to be sustainable. Half of farmers in Canterbury require a pay out higher than this.
- LUDF is break even $5.80 / kgMS. This is what is achievable. There are more examples of this level of break even, eg, Roadley, Pasture Summit 2019.
- Pay-out last 10 years $6.01 / kgMS. Last 3 years $6.36.
- Capital gain covered the lack of cashflow in the past 10 years as equity increased with land values. Land values are currently flat. Banks are not willing to fund losses any more.
- The expectation from the RBNZ (Reserve Bank) and most commercial banks is that we pay back debt, a 20 year payback = 2.6% PA.

The average farmer will need to choose between dividend or principal. For many farmers bank may (or will) make this choice. Do we need to be in this position?

TRANSFORMATIONAL CHANGE IN THE FARM BUSINESS

Case Study : James & Belinda McCone, North Canterbury

The Dilemma

Is the current Status Quo going to achieve our goals?

- *The farm performance has not been consistent*
- *The farm system was difficult to teach without micromanagement*
- *Profit margins have not been consistently high enough*

The driver to change?

2017/18 was a year frustrating year, milk price had lifted however we failed to capitalise on it. It was the year that tested us to question hard whether what we are doing would achieve our goals.

James and Belinda's growth ambitions:

- *Free cash for education*
- *Succession planning*
- *Time balance in and out of the farm*

They are all threatened unless we can achieve consistent strong performance.

Historically the farm system has weighted focus towards high per cow production with secondary focus on cost control. Up to 1 tonne of supplement was fed per cow with short rounds and high focus on feed quality. The principle being high per cow production would dilute a lot of largely fixed per cow costs and lower cost of production on a per MS basis. This has been very successful some years generating high profit per ha but has also delivered a couple of years of average financial performance. To achieve high per cow the decision rules around, residuals, supplement use and mowing were grey at best and hard to "teach". We also found that the secondary focus on cost control allowed slippage that eroded financial performance in some years. If production targets aren't hit and cost control is not well executed, then the result is pretty average at best.

The goal being consistency of high EBIT (not necessarily top 10% but consistent top quartile)

Matrix to achieve $5000 ebit off 6.40 milk price and 3.25 cows/ha and .55 c stock sales					
Prodn/cow	Prodn/ha		Fwe/ms		Ebit/ha
400	1300	$	3.10	$	5,000.00
430	1398	$	3.37	$	5,000.00
460	1495	$	3.61	$	5,000.00
490	1593	$	3.81	$	5,000.00

Kinloch	14/15	15/16	16/17	17/18	18/19	Average	Budget	Revised Budget
Effective Area	120	120	120	120	120		120	120
Peak Cows	398	367	370	370	390		390	390
Total Production	196258	176561	180508	171000	157500	176,365	167975	171145
Production per ha	1635	1471	1504	1425	1313	1,470	1400	1426
Production pr cow	493	481	488	462	404	466	431	439
Supplement per cow	689	487	667	994	110	589		
Nitrogen per ha	329	265	283	215	177	254		
Cost/kg supplement								
Farm Working Exp	$ 789,718.00	$ 643,987.00	$ 655,536.00	$ 704,000.00	$ 592,205.00	677,089	$ 611,926.00	$ 598,383.00
Farm Working/ms	$ 4.02	$ 3.65	$ 3.63	$ 4.12	$ 3.76	$ 3.84	$ 3.64	$ 3.50
Milk Price	$ 4.40	$ 3.90	$ 6.12	$ 6.69	$ 6.45	$ 5.51	$ 6.80	7.05
Revenue	$ 899,282.00	$ 936,914.00	$ 1,079,384.00	$ 1,244,206.00	$ 1,142,149.00	1,060,387	$ 1,212,462.00	$ 1,258,875.00
Actual Ebitda	$ 109,564.00	$ 292,927.00	$ 423,848.00	$ 540,206.00	$ 549,944.00	$ 383,297.80	$ 600,536.00	$ 660,492.00
Actual Ebitda/ha	$ 913.03	$ 2,441.06	$ 3,532.07	$ 4,501.72	$ 4,582.87	$ 3,194.15	$ 5,004.47	$ 5,504.10
Ebit @ 6.40 milk price and .55c Stock Sales	$ 4,785.63	$ 4,859.27	$ 4,991.62	$ 4,037.08	$ 4,186.83	$ 4,572.09	$ 4,629.17	$ 4,925.62

Dry Creek	14/15	15/16	16/17	17/18	18/19		Budget all in in CM	Revised Budget all in including CM
Effective Area	160	160	160	160	160	160	160	160
Peak Cows	542	507	506	531	500	530	530	530
Total Production	275668	259667	255429	247649	223793		243306	232857
Production per ha	1723	1623	1596	1548	1399		1521	1455
Production per cow	509	512	505	466	448		459	439
Supplement per cow	858	615	719	890	448	* unsure	384	384
Nitrogen per ha	290	290	254	267	232		230	230
Farm Working Exp	$ 1,292,882.00	$ 1,004,828.00	$ 885,240.00	$ 1,123,213.00	$ 899,256.00		$ 1,124,037.00	$ 1,121,631.00
Farm Working/ms	$ 4.69	$ 3.87	$ 3.47	$ 4.54	$ 4.02	$ 4.12	$ 4.62	$ 4.82
Milk Price	$ 4.40	$ 3.90	$ 6.12	$ 6.69	$ 6.45	$ 5.51	$ 7.05	7.05
Revenue	$ 1,241,195.00	$ 1,395,694.00	$ 1,541,044.00	$ 1,742,546.00	$ 1,583,473.00		$ 1,995,261.00	$ 1,946,305.00
Ebit	-$ 51,687.00	$ 390,866.00	$ 655,804.00	$ 619,333.00	$ 684,217.00	$ 459,706.60	$ 871,224.00	$ 824,674.00
Ebit/ha	-$ 323.04	$ 2,442.91	$ 4,098.78	$ 3,870.83	$ 4,276.36	$ 2,873.17	$ 7,260.20	$ 6,872.28
Ebit @ 6.40 milk price and .55c Stock Sales	$ 3,893.82	$ 4,999.11	$ 5,562.45	$ 3,737.17	$ 4,100.66	$ 4,458.64		

The Process of Change - Rethink & Reflect and Refine

- *Need to be personally vulnerable*
- *Listen to others.*
- *Be open minded.*
- *Be aware of own strengths and weakness.*
- *Take criticism.*
- *Deep reflection.*
- *Get some outside reflection / benchmarking is great.*
- *Advisory board / out side opinion.*
- *Trusted advisor. Some one who will tell you the truth, but will also be honest, focussed, unconflicted.*

The Process James and Belinda Worked through:

- Farm visits
- Detailed benchmarking
- Farm system analysis
- Budgets

We identified opportunities in both system and execution, it was probably 50:50 between what we are doing and how we are doing it.

From that we identified some key principles and then from that some key actions and the outline of a plan as outlined.

Then commit- having two farms we committed the smaller of the two. Commitment was big enough to matter but not big enough to kill us if it failed. Suck it and see fail fast.

- Focus on operational efficiency – cost per cow, kgMS per HA.
  - Benchmarking.
  - Using local data.
  - Sharing with neighbours.
- Focus on System:
  - Is it resilient ?
  - What is the demand on skills.
  - Can you execute every season with climate challenges.
  - Even simple systems standard require a high standard of execution.

The Plan and Future Pathway

These are the Principles that we have agreed need satisfied.

1. *Make system clear, simple and low risk. Easy to teach. Reducing the number of decision points were small marginal profits can be made if correct or large losses if wrong.*
2. *Involves least oversight possible.*
3. *Harvest max quality and quantity of feed per ha.*
4. *Feeding supplement can be profitable but is more commonly not.*

5. *Have disciplined process to achieve cost control.*
6. *Moderate per cow performance to minimise per cow costs but not compromise pasture harvested – perhaps 430- 450 ms/cow target?*
7. *Minimise depreciating gear*
8. *Minimise wastage in the system (animal good mating, feed wastage)*
9. *Actively manage body condition score throughout the year through OAD.*
10. *Needs to be capable of low relative N loss*
11. *If two systems have comparable profit pursue the lower cost option so that resilient at low milk price.*

Tactics that we have employed to achieve the principles:

1. *Make system clear, simple and low risk.*
    - *Control cost and execute grazing management with detail- let production happen.*
2. *Harvest max quality and quantity of feed per ha.*
    - *Planned higher N through spring while beet out*
    - *Accept that slightly slower rounds (compared to historic) which will deliver slightly lower quality but more quantity and consistency*
    - *Back fence spring and autumn*
    - *In spring use beet paddocks, next seasons beet paddocks as springer paddocks and stand-off paddocks in the wet to minimise pugging.*
3. *Have disciplined process to achieve cost control.*
    - *Detailed benchmarking of costs at budget setting*
    - *Budget must beat our 5yr average of $3.80/ms costs and should be able to deliver $3.50 costs.*
    - *Detailed budget for month in front and actuals from month finished shared monthly with farm manager. Lift understanding and accountability.*
    - *Do maintenance super and discretional R&M after xmas so that it can be trimmed if necessary.*
    - *Cost overrun in one area must be found in another*
    - *Have strict limits around supplement use.*
    - *Graze beet in situ*
    - *Minimal re-grassing*
    - *Clear rules and trigger points*
4. *Plan for moderate per cow performance to minimise per cow costs but not compromise pasture harvested 430-450 ms/cow target.*
5. *Minimise depreciating gear.*
    - *Try to eliminate wagon- (could if winter off?) and mower?*
    - *Use contractors where possible.*
    - *Look for opportunities to reduce amount of gear owned.*
6. *Minimise wastage*
    - *Feed under a wire/use bale feeders when fed ad lib.*
    - *Look for potential to optimise labour ie 16 hour rather and cut labour unit post xmas.*
    - *Benchmark cow losses and have clear targets.*
7. *Actively manage body condition score throughout the year through OAD.*
    - *Proactive OAD herd with up to 25% OAD throughout year*
      Use OAD before bought in supplement.
8. *Needs to be capable of low N loss*
    - *Winter off option to lower total loss.*
    - *Limit N use.*
    - *Reduce autumn N use*

- *Low imported supplement and consequently SR*
- *Incorporate plantain*
- *Model system change in overseer*

Leadership:

- Make a strong team, but be conscious that it will have weakness's and flaws.
- Be self aware.
- Delegate / aware of others strengths. Work as a team.

THE CANTERBURY DAIRY FARMER

This exercise based on the Canterbury Average 2018/19 Dairy Base results. We have based the numbers on LUDF size dairy farm of 161 HA.

The Dilemma

- The Average Farm requires a pay-out of $6.70 to be sustainable. Half of farmers in Canterbury require a pay out higher than this.
- LUDF is Break even is $5.80 / kgMS. This is what is achievable. There are more examples of this level of break even, eg, Roadley, Pasture Summit 2019.
- These farms imported far less feed. Can the average farm do this?

Farm System - Rethink

- Feed imported dropped from 514 to 113 kgDM/cow.
- Maintain Feed harvested per Hectare.
- Increase feed harvested per cow.
- Feed removed from budget and additional costs, $1.50 of Farm operating costs per $1.00 spent on feed (Dairy NZ 2019, Mark Neal, MRB Presentation).
- Production will drop from 246,000 to 219,000 if we cut back the supplements. Based on a 10:1 response rate.

Farm System:

- Need to have the demand matching the farms potential summer growth rate for your farm. LUDF = 68 kgDM/Ha for summer growth.

Demand kgDM/Ha		Stocking Rate (cows/Ha)				
Milking production kgMS/cow	kgDM/cow	2.9	3.1	3.3	3.5	3.7
1.6	16.9	49	53	56	59	63
1.8	18.3	53	56	60	63	67
2	19.3	56	60	64	68	71
2.2	20.3	59	63	68	72	76

Risk of not harvesting 100 % of pasture on irrigated Canterbury

Risk of having to feed supplement for demand = growth

Reflect and Refine

- What skills do you need to increase feed harvested per cow, pasture monitoring etc.
- Who else is doing this in your district. Spend some time with them.
- Get a team of trusted advisers / people involved to work through this with.
- Where are the savings going to be for the additional costs over and above feed:
    - Labour – is the system as intense, eg, OAD and the tail.
    - Less cows run with a lower stocking rate?
    - Less vehicle expenditure
    - Less R&M

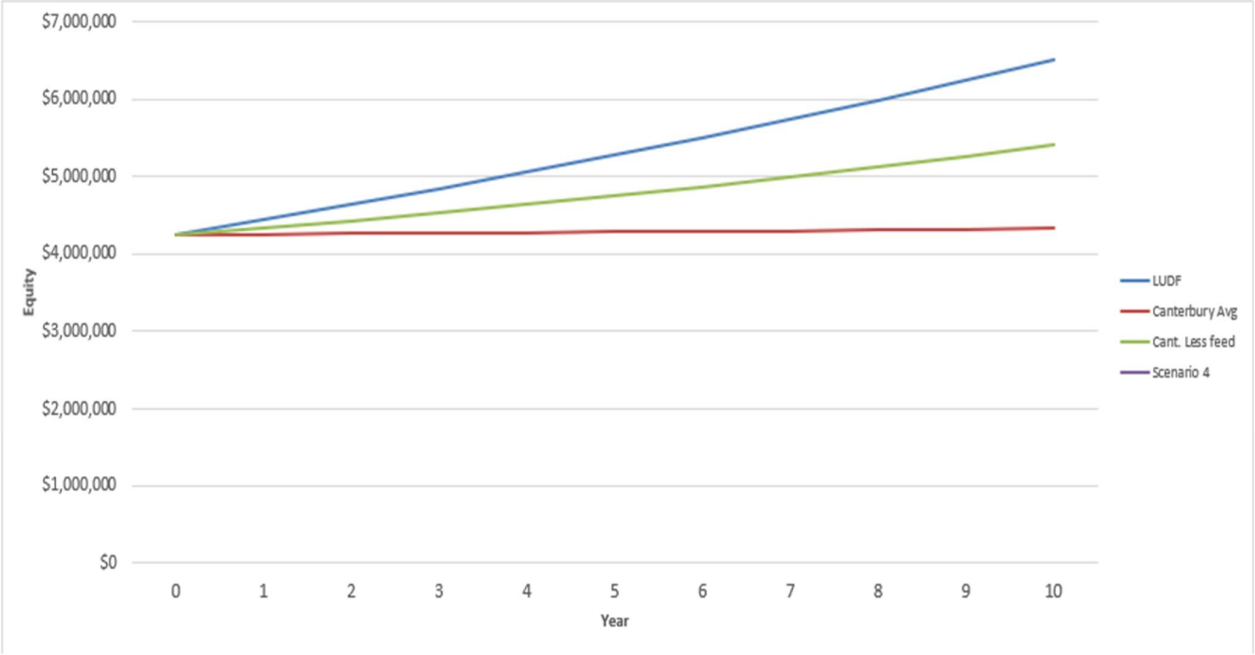
Have a good think about your goals and whether the pathway you are on is likely to achieve them?

If change is needed what might be the road blocks?

- Cashflow
- Pride.
- Staff & Skills management.
- Workload.
- Age and stage.
- Drop in production.
- Lack of profit, can create a freeze mentality.

If change is needed to achieve the outcomes you are after all of these things can be overcome with an open mind and some help from the right people at the right time.

Future Pathway – Dairy NZ Equity Forecast Tool



Dairy NZ Equity Tool template

Equity Growth Scenarios	LUDF	Canterbury Avg	Cant. Less feed
Comments on each scenario		2018/19	2018/19
Year	**1**	**1**	**1**
Effective dairying area (hectares)	161	161	161
Peak cows milked	550	563.5	501
Milk production (kg MS)	275,000	246,813	219,389
Milksolids/ha	1,708	1,533	1,363
Milksolids/cow	500	438	438
Milk Income ($/kg MS)	$6.40	$6.40	$6.40
Milk income ($ Total)	$1,760,000	$1,579,603	$1,404,092
Number of Dairy Company Shares Owned *any additional shares purchased need to be "paid for" in row 44*	-		
Dairy Company Dividend Income ($/Share)	$0.00		
Net Livestock Income - *sales less purchases plus/minus change in numbers ($)*	$147,000	$71,576	$63,623
Other income ($)	$0	$12,341	$10,969
Total income	**$1,907,000**	**$1,663,520**	**$1,478,684**
Farm working exp ($/kg MS)	$3.80	$4.49	$3.85
Farm working expenses ($ Total)	$1,045,000	$1,108,190	$844,988
Allowance for new plant + vehicles + other depreciable assets	$116,000	$123,407	$116,000
Depreciation	$116,000	$123,407	$116,000
Rent or lease (excluding support blocks) ($)	$0		
Interest rate (%)	5.00%	5.00%	5.00%
Total interest paid ($)	$275,000	$275,000	$275,000
Interest & rent ($/kgMS)	$1.00	$1.11	$1.25
Tax rate (%)	28%		
Deficits brought forward for tax purposes	$0	$0	$0
Drawings/dividends paid ($) (net of any off-farm income deposited back in the business)	$150,000	$150,000	$150,000
Total Expenses ($)	**$1,717,880**	**$1,656,597**	**$1,385,988**
Net capital expenditure on land, stock, shares (non-depreciable asse	$0		
Cash surplus after Capital Expenditure ($)	**$189,120**	**$6,923**	**$92,696**
Cash surplus ($/kg MS)	$0.69	$0.03	$0.42
Breakeven milk price (to enabe planned CAPEX programme)	$5.71	$6.37	$5.98
Opening assets and debt are direct from Tab 1 (you can override by typing in the cell)	**Opening**	**Opening**	**Opening**
Total Debt	$5,500,000	$5,500,000	$5,500,000
Total Assets before capital gain	$9,745,000	$9,745,000	$9,745,000
Estimated % capital gain or loss (land, stock, shares etc)	0%	0%	0%
Estimated total capital gain or loss (land, stock, shares etc)	$0	$0	$0
Total Assets after capital gain	$9,745,000	$9,745,000	$9,745,000
Debt:Asset ratio	54%	56%	56%
Equity $	**$4,434,120**	**$4,251,923**	**$4,337,696**
Compounding equity growth % from Year 0	**4.5%**	**0.2%**	**2.2%**

DairyBase

Profitability KPI's

Lincoln University Dairy Farm IFB- Production Year (Farm ID: 725852)
Dairy Season ended: 2019 Printed: 10 December 2019

Number in Benchmark Group:	52	
Benchmark Group Selected by:	Profitability analysis Region : Marlborough-Canterbury	Farm business type : 1- Owner operator
Benchmark Group Ranked by:		

FARM PHYSICAL KPI's	2018-19		2017-18		2016-17	
	Farm	Benchmark	Farm	Benchmark	Farm	Benchmark
Cows/ha	3.4	3.5	3.5	3.5	3.5	3.4
Kg Milksolids/ha	1,733	1,546	1,571	1,510	1,789	1,530
Kg Milksolids/cow	504	438	451	433	516	444
Cows/FTE	153	177	151	158	142	164
Kg MS/FTE	77,026	77,494	67,952	68,441	73,382	72,842

PROFITABILITY Dairy	2018-19		2017-18		2016-17	
	Farm	Benchmark	Farm	Benchmark	Farm	Benchmark
Gross Farm Revenue/ha	12,028	10,525	11,384	10,705	12,214	9,467
Operating Expenses/ha	7,319	7,713	7,267	7,682	7,453	7,065
Operating Profit (EFS)/ha	4,709	2,812	4,117	3,023	4,760	2,402
Gross Farm Revenue/kg MS	6.94	6.81	7.24	7.09	6.83	6.19
Operating Expenses/kg MS	4.22	4.99	4.62	5.09	4.17	4.62
Operating Profit (EFS)/kg MS	2.72	1.82	2.62	2.00	2.66	1.57
FWE/kg MS	4.05	4.35	4.16	4.31	3.76	3.89
Operating Profit Margin %	39.2%	26.7%	36.2%	28.2%	39.0%	25.4%

LIQUIDITY	2018-19	2017-18	2016-17
Net Cash Income	1,938,900	1,790,259	1,957,625
Farm Working Expenses	1,124,021	1,046,767	1,076,527
Cash Operating Surplus	814,879	743,492	881,098

Profitability Cash Flow

CASH	$/KG MS	$	NON CASH ADJUSTMENTS	$	CASH + NON CASH	$
DAIRY SALES					DAIRY GFR	
Net Milk	6.41	1,777,435			Net Milk	1,777,435
Net Livestock	0.58	161,465	+ Value of Change in	-14,454	Net Livestock	147,011
Other Dairy	0.00	0	Dairy Livestock		Other Dairy	0
NET CASH INCOME	6.99	1,938,900			DAIRY GFR	1,924,446

CASH FWE	$/KG MS	$	NON CASH ADJUSTMENTS	$	OPERATING EXPENSES	$
Wages	0.85	237,056	+ Labour Adj	0	Labour Expenses	237,056
Stock Expenses	0.58	160,459			Stock Expenses	160,459
Supplementary Feed	0.50	138,371	- Feed Inventory Adj	69,000	Total Supplement Expenses	69,371
Grazing and Support block	0.95	264,480	+Ownd Supp block Adj	0	Total Grazing and Support block	264,480
Other Working Expenses	1.00	277,016			Other Working Expenses	277,016
Overheads	0.17	46,639	+Depreciation	116,000	Total Overheads	162,639
FARM WORKING EXPENSES	4.05	1,124,021			OPERATING EXPENSES	1,171,021

CASH OPERATING SURPLUS	2.94	814,879	NET ADJUSTMENTS	-61,454	DAIRY OPERATING PROFIT (EFS)	753,425

DairyBase

Financial Detail

Lincoln University Dairy Farm IFB- Production Year (Farm ID: 725852)
Dairy Season ended: 2019 Printed: 10 December 2019

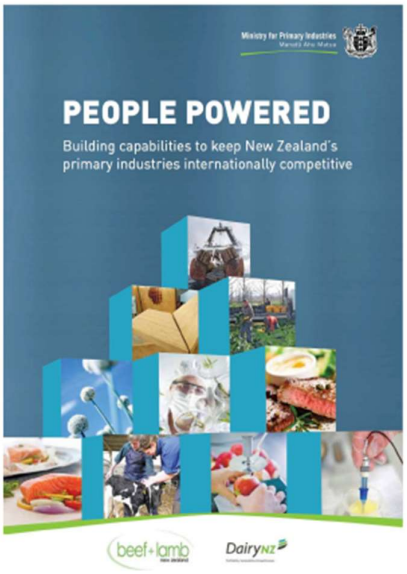
Number in Benchmark Group:	52	
Benchmark Group Selected by:	Profitability analysis Region : Marlborough-Canterbury	Farm business type : 1- Owner operator
Benchmark Group Ranked by:		

	Total $		$ Per kg MS		$ Per Ha		$ Per Cow	
GROSS FARM REVENUE (GFR)	**Farm**	**% of GFR**	**Farm**	**Benchmark**	**Farm**	**Benchmark**	**Farm**	**Benchmark**
Net Milk Sales	1,777,435	92.4%	6.41	6.48	11,109	10,012	3,232	2,834
Net Dairy Livestock Sales	161,465	8.4%	0.58	0.26	1,009	398	294	113
Value of Change in Dairy Livestock	-14,454	-0.8%	-0.05	0.03	-90	42	-26	12
Other Dairy Revenue	0	0.0%	0.00	0.05	0	73	0	21
DAIRY GROSS FARM REVENUE	1,924,446	100.0%	6.94	6.81	12,028	10,525	3,499	2,979
Non-Dairy Cash Income								
Value of Change in Non-dairy livestock								
Total Gross Farm Revenue								
OPERATING EXPENSES								
Labour Expenses								
Wages	237,056	12.3%	0.85	0.83	1,482	1,277	431	361
Labour Adjustment - Unpaid	0	0.0%	0.00	0.01	0	15	0	4
Labour Adjustment - Management	0	0.0%	0.00	0.07	0	114	0	32
Total Labour Expenses	237,056	12.3%	0.85	0.91	1,482	1,407	431	398
Stock Expenses								
Animal Health	66,810	3.5%	0.24	0.22	418	336	121	95
Breeding & Herd Improvement	66,015	3.4%	0.24	0.14	413	215	120	61
Farm Dairy	7,634	0.4%	0.03	0.08	48	130	14	37
Electricity (Farm Dairy, Water Supply)	20,000	1.0%	0.07	0.08	125	128	36	36
Total Stock Expenses	160,459	8.3%	0.58	0.52	1,003	808	292	229
Feed Expenses								
Supplement Expenses								
Net Made,Purchased,Cropped	132,371	6.9%	0.48	0.79	827	1,215	241	344
Less Feed Inventory Adjustment	69,000	3.6%	0.25	0.01	431	13	125	4
Calf Feed	6,000	0.3%	0.02	0.05	38	72	11	20
Total Supplement Expenses	69,371	3.6%	0.25	0.82	434	1,273	126	360
Grazing & Run Off Expenses								
Young & Dry Stock Grazing	252,560	13.1%	0.91	0.46	1,578	706	459	200
Winter Cow Grazing	0	0.0%	0.00	0.18	0	277	0	78
Support block Lease	11,920	0.6%	0.04	0.03	74	39	22	11
Owned Support block Adjustment	0	0.0%	0.00	0.06	0	95	0	27
Total Grazing & Support block expenses	264,480	13.7%	0.95	0.72	1,653	1,116	481	316
Total Feed Expenses	333,851	17.3%	1.20	1.55	2,087	2,389	607	676
Other Working Expenses								
Fertiliser	88,364	4.6%	0.32	0.30	552	470	161	133
Nitrogen	0	0.0%	0.00	0.12	0	182	0	51
Irrigation	41,123	2.1%	0.15	0.25	257	388	75	110
Regrassing	3,872	0.2%	0.01	0.06	24	90	7	26
Weed & Pest	109	0.0%	0.00	0.01	1	23	0	6
Vehicles	31,295	1.6%	0.11	0.05	196	72	57	20
Fuel	0	0.0%	0.00	0.05	0	75	0	21
R & M - land & buildings	0	0.0%	0.00	0.19	0	291	0	82
R & M - plant and equipment	98,950	5.1%	0.36	0.11	618	177	180	50
Freight and General	13,303	0.7%	0.05	0.08	83	128	24	36
Total Other Working Expenses	277,016	14.4%	1.00	1.23	1,731	1,895	504	537
Overheads								
Administration	24,139	1.3%	0.09	0.16	151	240	44	68
Insurance	10,500	0.5%	0.04	0.06	66	96	19	27
ACC	0	0.0%	0.00	0.02	0	29	0	8
Rates	12,000	0.6%	0.04	0.05	75	76	22	22
Depreciation	116,000	6.0%	0.42	0.50	725	772	211	219
Total Overheads	162,639	8.5%	0.59	0.78	1,016	1,213	296	343
TOTAL DAIRY OPERATING EXPENSES	1,171,021	60.8%	4.22	4.99	7,319	7,713	2,129	2,183
Non-Dairy Operating Expenses								
Total Operating Expenses								
OPERATING PROFIT								
DAIRY OPERATING PROFIT	753,425	39.2%	2.72	1.82	4,709	2,812	1,370	796
Non-Dairy Operating Profit								
Total Operating Profit								

OUR FUTURE, THEIR FUTURE

Dr Michelle Glogau

Critical need for a skilled and experienced workforce



GROWING NZ

By 2025:

50,000 more workers

62% formal, post-secondary school qualification

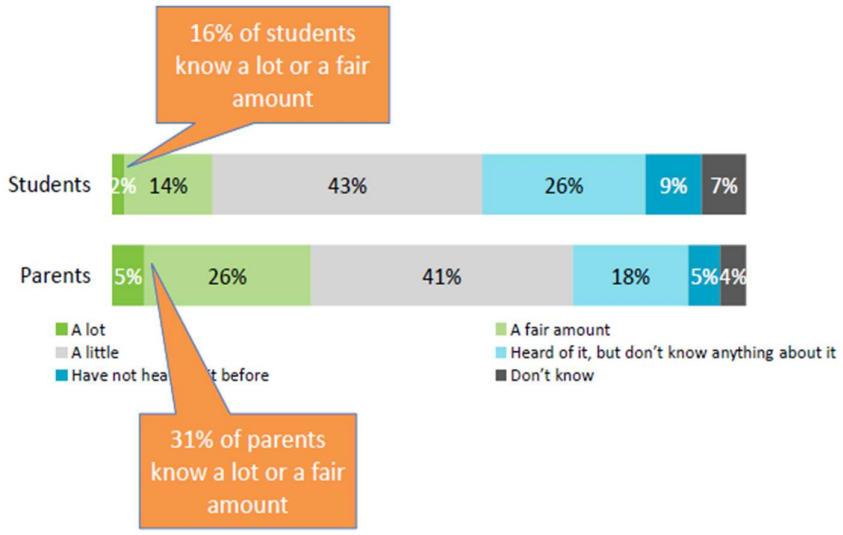
More professional skills

GROWING NZ

Primary Industry Capability Alliance (PICA)

An alliance of industry, education providers and government working together to attract talented people into our innovative primary sectors.

Young people don't know much about our sector



How much, if anything, do you know about the primary industries sector?

Most common definition

"Sectors that focus on growing – agriculture, producers of primary products"

How would you define the Primary Industries?
- *Students that knew at least a little about primary industries*

GROWING NZ

Attitudes towards the sector

- Important for the economy
- Opportunities to innovate
- Flexibility about location
- Leading edge technology
- Needs high-level skills

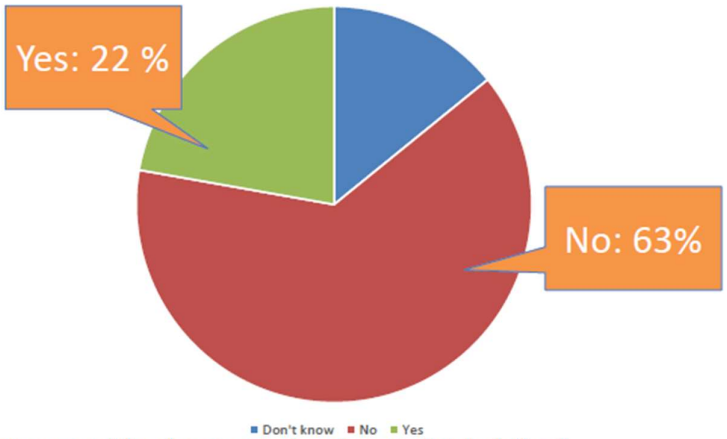
GROWING NZ

Attitudes towards the sector

- Doesn't offer equal career opportunities
- Career isn't highly appealing
- Doesn't attract high achieving students
- Family wouldn't encourage

GROWING NZ

A career in the primary industry doesn't rate



Have you ever considered a career in the primary industries before?

GROWING NZ

Most common jobs or roles

Farm worker
63%

Forester
27%

Fisherman
20%

What jobs or roles are there in Primary Industries?
- *Students that knew at least a little about primary industries*

GROWING NZ

Least associated jobs

Robotics
22%

Please indicate whether or not the following jobs are in Primary Industries?

GROWING NZ

A different outcome?

"I have learnt more about what is included in this industry, and I have learnt that I've always had an interest in some jobs in this industry, but never actually knew what the primary industry was"

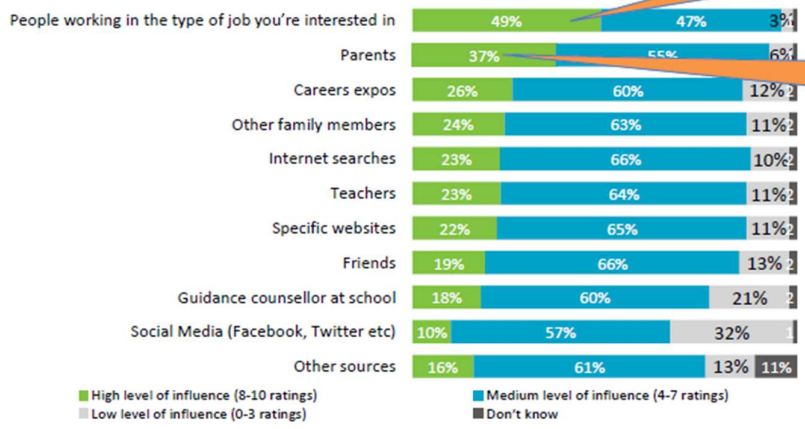
Secondary school student

GROWING NZ

Most influential on career choice

People working in job-of-interest 49%

Parents 37%



How much influence will each of the following have on your eventual job or career choice?

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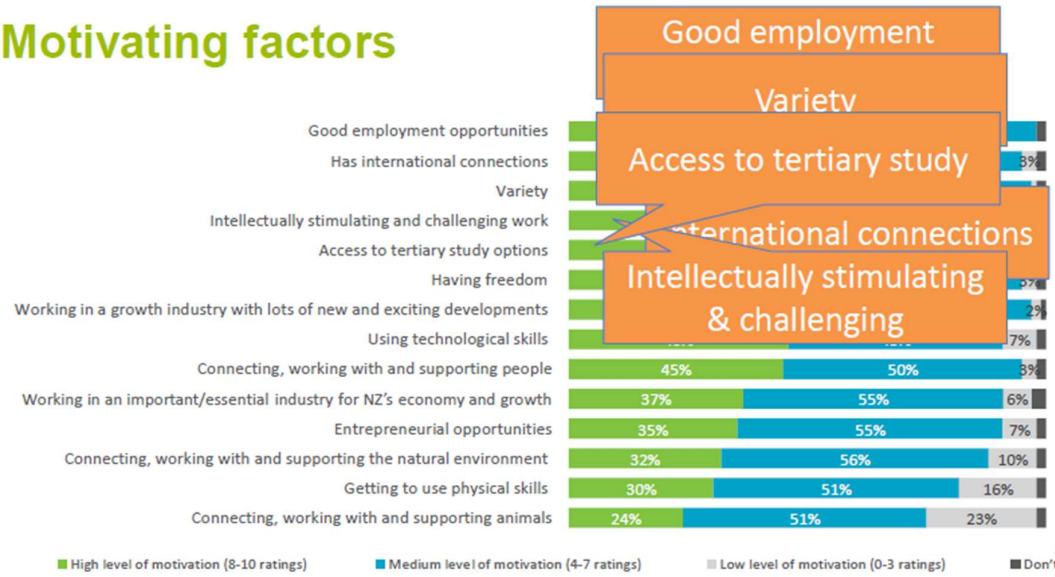
Motivating factors



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Turning research into strategy

- Raise awareness about the diversity of roles and pathways
- Dispel the misconceptions – students & influencers
- Start early in schooling
- Use [young] role models as communicators
- Integrate into curriculum
- Recognise & address valid concerns
- Leverage motivational aspects
- Focus on city-roles for those strongly tied to the city

GROWING NZ

An appealing and fresh brand

GROWING NZ

GROWING NZ

Messaging that is inclusive and contemporary

A FUTURE FOR EVERY TALENT IN OUR INNOVATIVE FOOD & FIBRE SECTORS

GROWING NZ

Painting a rich, diverse picture of roles

GROWING NZ

Painting a rich, diverse picture of roles

ROBOTICS ENGINEERS, FARM MANAGERS, SOFTWARE DEVELOPERS, GENETICISTS, ENVIRONMENTAL SCIENTISTS...

These are just a handful of roles you could explore to help New Zealand grow.

Our innovative food & fibre sectors include everything from growing quality food, wood and wool to making these into other products. It also involves taking them to the world.

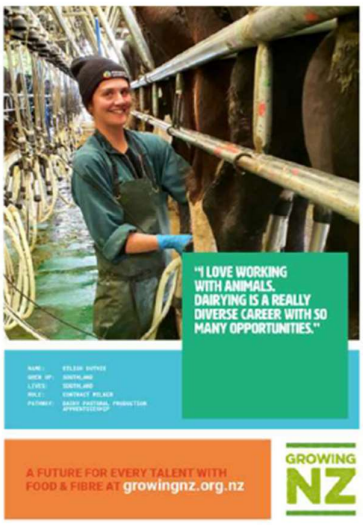
For our food & fibre sectors to thrive we need a lot of different people with a lot of different talents.

Find your fit with food & fibre at **growingnz.org.nz**

GROWING NZ

GROWING NZ

Authenticity - real people, real stories



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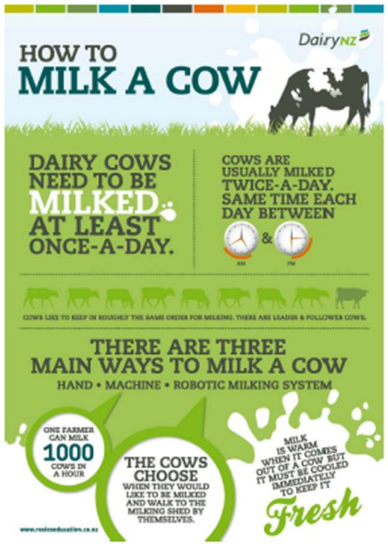
Connecting - through curriculum resources



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Connecting - through experience days

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Connecting - through social media

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Influencing the influencer – experience days

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Influencing the influencer – teacher conferences

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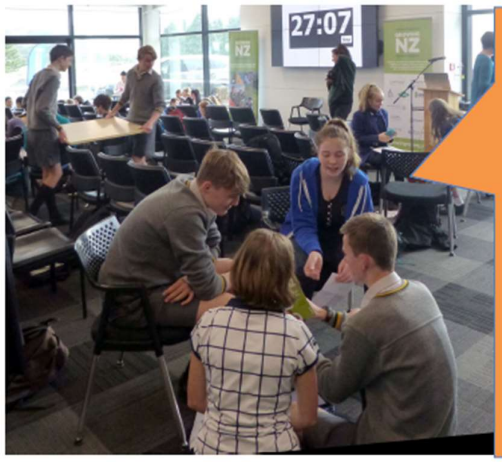
Measuring success - students

GrowingNZ National Careers Expos Campaign

83% of visitors more aware about career opportunities

58% of students very / extremely likely to consider a career

Measuring success - targeted science, technology, and business students



GrowingNZ Innovation Challenge

82% of students more aware about career opportunities

86% of teachers more aware about career opportunities

93% of teacher very or extremely likely to recommend a career

Measuring success – teachers & careers advisor

GrowingNZ Teachers Day Out

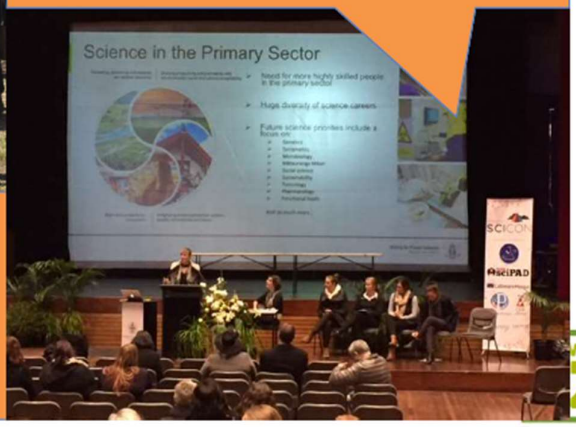
100% of teachers more aware about career opportunities

100% of teachers very /extremely likely to recommend a career

GrowingNZ at Teacher conference – eg CATE

92% of teachers more aware about career opportunities

92% of teacher very / extremely likely to recommend a career



Building on the momentum

- Collaborative, joined-up approach through PICA
  - Extend the audience for campaigns
  - Research into successful transitions
- Sector to adopt "Food & Fibre" terminology and consistent messaging
- CareersNZ's "Food & Fibre" Hub
- TEC's "Inspiring the Futures" programme
- Food & Fibre Skills Action Plan - Skills Establishment Group


The food & fibre sectors...
A FUTURE FOR EVERY TALENT
GROWING NZ
growingnz.org.nz

PROVENANCE & SUSTAINABILITY

Josh Sigmund

This is driving increasing sales of sustainable products, across food and beverage as well as dairy

SUSTAINABILITY SELLS

THE IMPACT SUSTAINABLE ATTRIBUTES ARE HAVING ON CPG

THE OPPORTUNITY

SALES PROJECTIONS BASED ON THREE-AND TWO-YEAR COMBINED AVERAGE GROWTH RATES

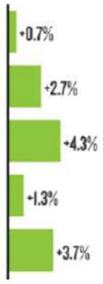
BY 2021 WE EXPECT SUSTAINABLY-MINDED U.S. SHOPPERS TO SPEND UP TO $150 BILLION ON SUSTAINABLE CPG GOODS.

THIS REPRESENTS AN INCREASE OF BETWEEN **$14 BILLION - $22 BILLION**

73% OF GLOBAL CONSUMERS SAY THEY WOULD DEFINITELY OR PROBABLY CHANGE THEIR CONSUMPTION HABITS TO REDUCE THEIR IMPACT ON THE ENVIRONMENT

SUSTAINABILITY DRIVES CPG SALES

FOOD AND BEVERAGE SALES GROWTH VS. YEAR AGO (YEAR ENDED MARCH 9, 2019)



$30B

Dairy with clean labels set to grow to **$30 billion in 2020**... amongst fastest growing claim in food & beverages

Source: Nielsen 2019, Euromonitor

1/3 the global average.*

Fonterra's New Zealand on-farm carbon footprint is approximately 1/3rd the global average.*


Consumers can be
a little challenging


Ambitious commitments are becoming common and not always a direct link to sales
Fonterra
Dairy for life
Unilever
Nestlé
MARS
CDP
DRIVING SUSTAINABLE ECONOMIES
dsf
Dairy Sustainability Framework
Confidential to Fonterra Co-operative Group

How can we sell our story

The Co-operative Difference

Clear guidance on future direction based on emerging customer, consumer and community trends

All on-farm activities aligned across five focus areas

Well defined terms of supply to protect the co-operative here and now

Supporting our farmers underpins everything we do.

In person, in digital, In partnership

Recognition for farmers who are moving beyond the terms of supply

LATEST FARM WALK NOTES

LINCOLN UNIVERSITY DAIRY FARM - FARM WALK NOTES

Tuesday 11th February 2020

LUDF – focus for 2019/20 Season: Nil-Infrastructure, low input, low N-loss, optimise profit.

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

CRITICAL ISSUES FOR THE SHORT TERM

1. **Managing average pasture cover / cow intakes / residuals as pastures start going to seed**
2. **Monitor Soil moisture and irrigate accordingly**

Key points:

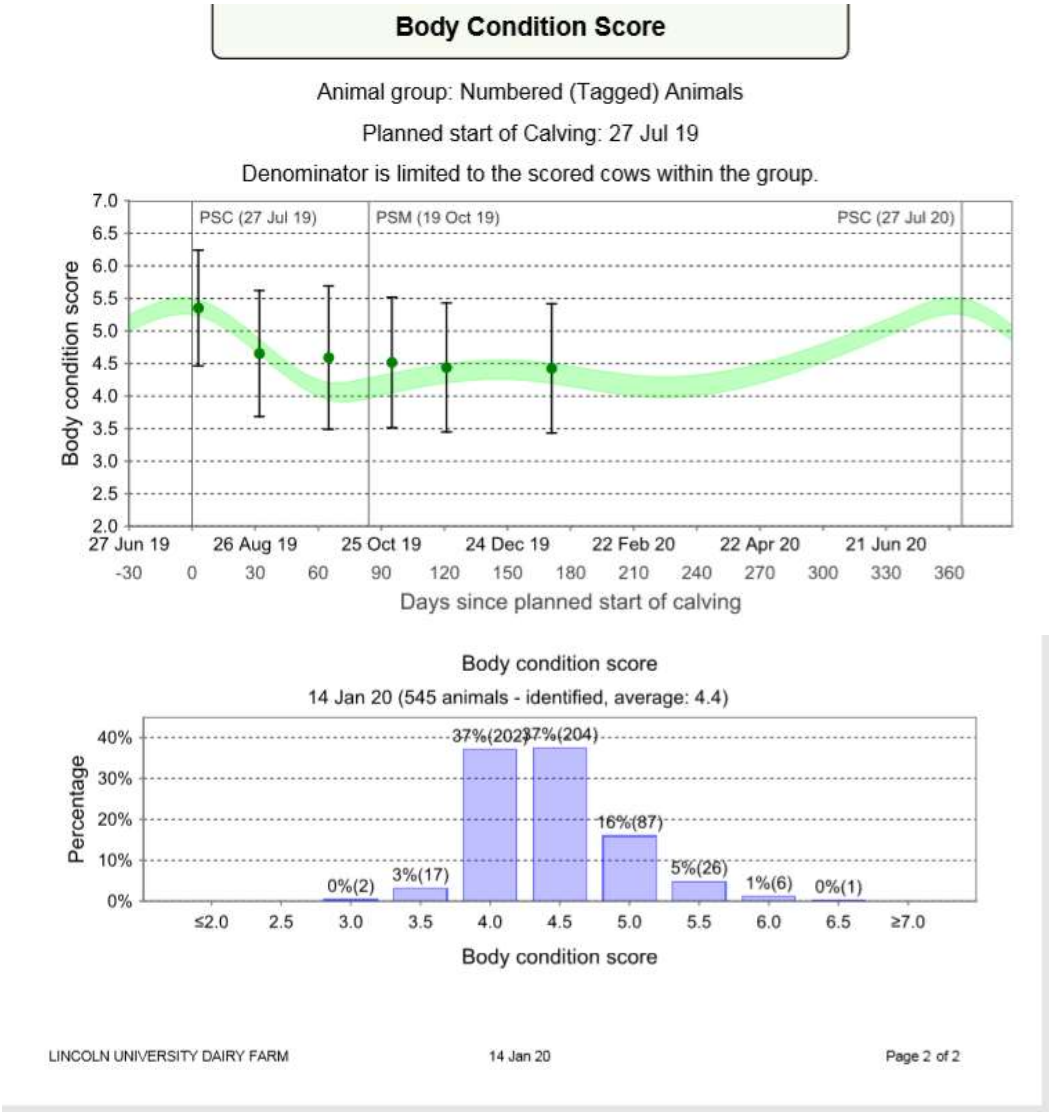
Growth 61 KgDM
Farm cover 2315
Round length 22 days off 153 Ha
Ai finished 31st December
71% - 6 week in calf rate
16% empty rate in cows in milk
8% empty in R2 Heifers
Cows averaged 1.82 Kg MS
8.8 Mils of rain for the week
548 cows in milk

Key Numbers - week ending Tuesday 11th February 2020

Ave Past Cover	2315gDM/ha (Rising Plate Meter)	**Pasture Growth Rate**	61 kgDM (Rising Plate Meter)
Round length	22 (for 153ha)	**Ave Supplement used (Milking cows)**	0 kgDM/ milking cow/day
No Cows on farm	548	**Ave Soil Temp (week)**	16°C
SCC	90,000	**Ave kgMS/cow/day (cows in vat)**	1.82 kgMS
Protein / Fat	.83	**Milk Fat** – 5.15	**Milk Protein** - 4.27

Herd Management

3. There are 548 cows in milk.
4. The small herd has been rearranged into low body condition score cows that are calving early next season. There are 166 cows in the small herd now.
5. All heifer replacement calves have been vaccinated with a 7-in-1, received a copper bullet, and were given B-12 plus selenium and were drenched on November 20th .They received their follow up booster shot of 7 in 1 on the 19th December and also were given their first shot of 2 of BVD.
6. Heifers were weighed last Thursday 30th January and were given their 2nd BVD Vaccine and were given B12 plus selenium
7. BCS of cows in milk was done on Monday 14th January, 4.4 average BCS below are the graphs.



Mating

8. Yearling heifers were preg tested 21st December to see how many got incalf to Ai .There were 82 out of 158 comfirmed in calf to Ai 51% .Of the 158 there were 141 submitted for Ai which is 58%
9. 8% empty from scan on Monday 27th January of R2 Heifers
10. Bulls removed from heifers 16 December .Total 10 weeks of mating.
11. Preg Test on 13th January confirmed 71% 6 week in calf of cows in milk and preg test done on 7th February confirmed 16% of cows in milk as empty. Total mating period 75 days.

Growing Conditions

12. The average 9 am soil temperature this week has been 16 °C.

Figure 1: Soil temperature history for the last 2 weeks

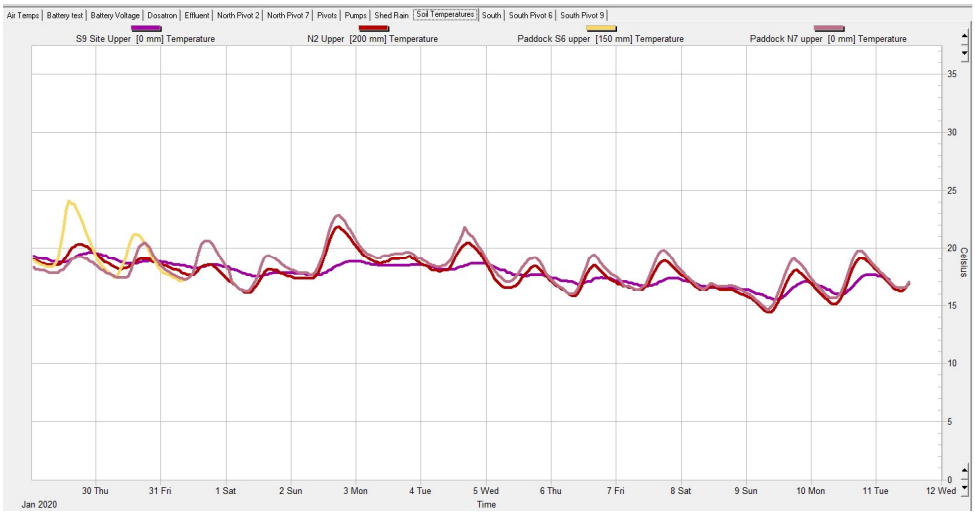
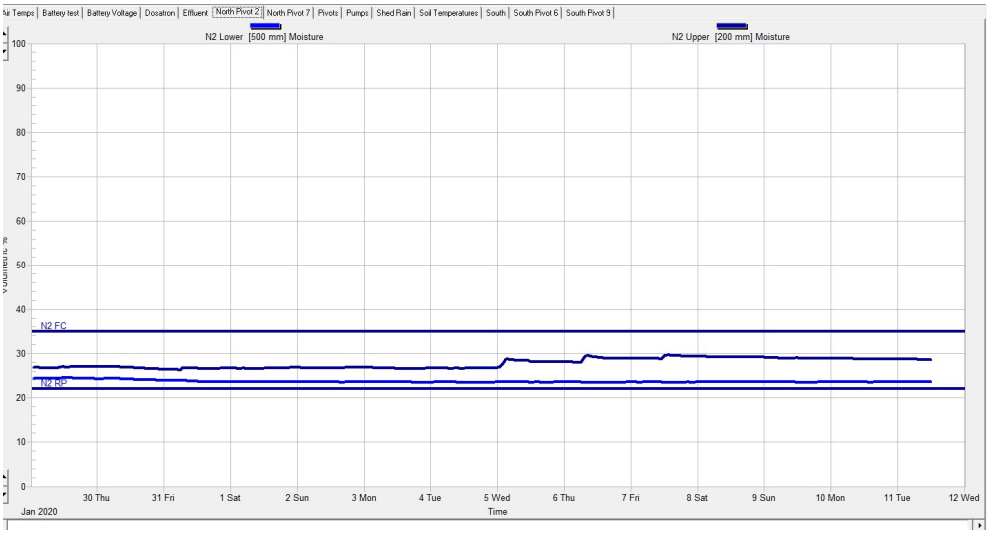


Figure 2: Soil moisture history for the last 2 weeks (Paddock N2).

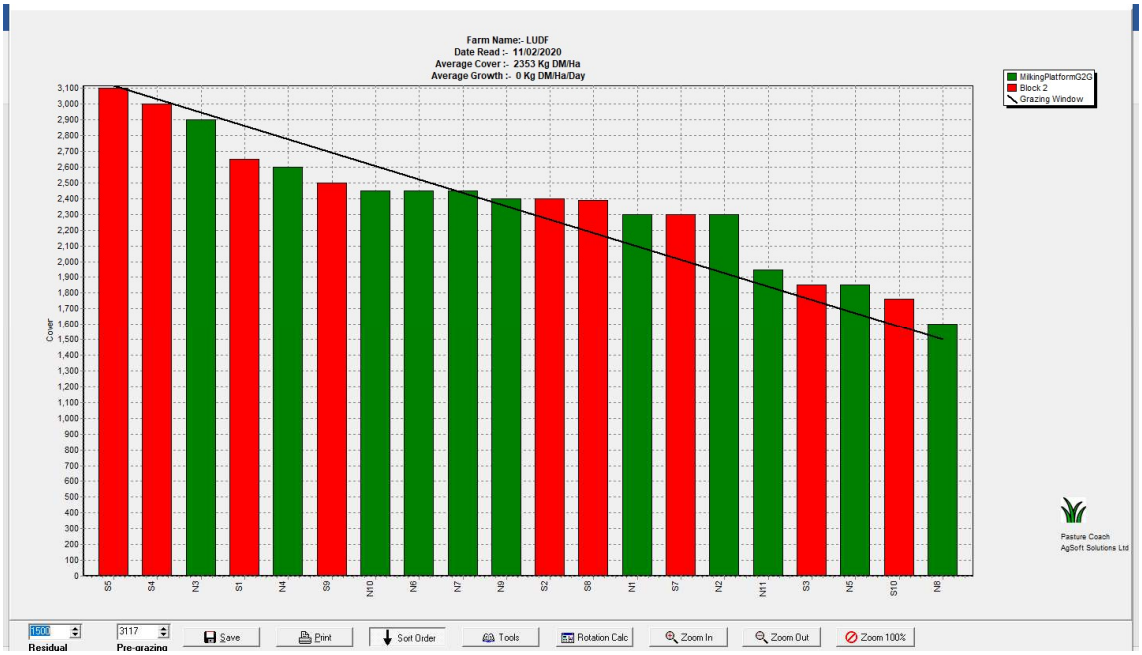


13. This week's graph represents the reading from the North Block moisture meters.

14. 3 days of irrigation on the north block and 3 days of irrigation on the south block over the last week. Soil moisture has increased due to the small amount of rain and the cooler days over the last week.
15. The farm received 8.8 mils of rain over the last week.

Pasture and Feed Management

Figure 3: This week's feed wedge



16. Average Pasture Cover is 2438 kgDM/ha .
17. The pregrazing required for the demand line is calculated as follows:
    a. 548 cows eating 18 kgDM/cow/day = 9864 kgDM/day or 61 kgDM/Ha/day)
    b. We will be grazing the farm on a 25 day round = 6.1 ha grazed/day
    c. 9864kgDM/day / 6.1 ha/day = 1,617 kgDM
    d. Pre-graze cover = 1617 + 1500 = 3117 kgDM/ha.

18. Round length last week was 22 days with a target of 25 days round.
19. No silage fed over the last week
20. N-Protect was applied to 35 Ha at a rate of 55Kg Urea /ha over the last week.
21. No mowing over the last week.
22. Paddock N-3 was sprayed out 30th November for re grassing. This was direct drilled back into pasture on the 10th December .Mix was Trojan ,Viscount plus clover, sowing rate 30Kg /Ha .Total area available for cows is now 153 Ha until this paddock comes back into the round.
23. Paddock N-3 had a post emergence spray to control the weeds on Wednesday the 8th January.
24. Paddock N-3 has now been returned back into available area and has had its first grazing.
25. Paddock S-6 was sprayed out 8th January for re grassing. This was direct drilled back into pasture on the 28th January .Mix was Trojan ,Shogun plus clover, sowing rate 30Kg /Ha .Total area available for cows is now 153 Ha until this paddock comes back into the round

Feeding Management for the coming month:

26. We currently have 548 cows grazing on the milking platform.
27. Milkers will be fed on grass and if required silage to ensure we maintain a minimum 22-25 day round.
28. Urea will be applied through the week as weather allows and whole paddocks become available.
29. We will monitor round length over the next week supplement will be used if required to hold round length.

LUDF Weekly report	14-Jan-20	21-Jan-20	28-Jan-20	4-Feb-20	11-Feb-20
Farm grazing ha (available to milkers)	153.1	153.1	153.1	153.1	153.1
Dry Cows on farm / East blk /Jackies/other	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0	0/0/0/0
Culls (Includes culls put down & empties)	3	0	0	0	0
Culls total to date	17	17	17	17	17
Deaths (Includes cows put down)	0	0	0	0	0
Deaths total to date	12	12	12	12	12
Calved Cows available (Peak Number 560…)	548	548	548	548	548
Treatment / Sick mob total	0	0	0	0	0
Mastitis clinical treatment	0	0	0	0	0
Mastitis clinical YTD (tgt below 64 yr end)	45	45	45	45	45
Bulk milk SCC (tgt Avg below 150)	77	85	72	81	90
Lame new cases	2	8	5	10	10
Lame ytd	84	102	107	117	127
Lame days YTD (Tgt below 1000 yr end)	1746	1844	1963	2138	2327
Other/Colostrum	0	0	0	0	0
Milking twice a day into vat	539	534	531	523	521
Milking once a day into vat	9	14	17	25	27
Small herd	170	166	160	160	158
Main Herd	369	368	371	363	363
MS/cow/day (Actual kg / Cows into vat only)	1.88	1.82	1.83	1.82	1.82
Milk Protein/Fat ratio	0.84	0.83	0.85	0.82	0.83
Milk Fat %	5.04	5.15	5.01	5.15	5.15
Milk Protein %	4.24	4.26	4.24	4.23	4.27
MS/cow to date (total kgs / Peak Cows 560	314	326	339	352	362

LUDF Weekly report	14-Jan-20	21-Jan-20	28-Jan-20	4-Feb-20	11-Feb-20
MS/ha/day (total kgs / ha used	6.72	6.51	6.55	6.50	6.50
Herd Average Cond'n Score	4.40	0.00	0.00	0.00	0.00
Monitor group LW kg WOW 281 early calvers	490	494	497	495	495
Soil Temp Avg Aquaflex	16.5	17.0	17.9	18.4	16.0
Growth Rate (kgDM/ha/day)	73	72	82	78	61
Plate meter height - ave half-cms	13.9	13.8	14.1	13.8	13.2
Ave Pasture Cover (x140 + 500)	2445	2425	2472	2438	2353
Surplus/[defict] on feed wedge- tonnes	0	0	0	0	0
Pre Grazing cover (ave for week)	3178	3302	3282	3327	3247
Post Grazing cover (ave for week)	1550	1550	1550	1550	1550
Highest pregrazing cover	3400	3400	3375	3400	3320
Area grazed / day (ave for week)	5.71	6.03	6.10	6.07	7.08
Grazing Interval	27	25	25	25	22
Milkers Offered/grazed kg DM pasture	0.0	0.0	0.0	0.0	0.0
Pasture ME (pre grazing sample)	0.0	12.1	0.0	0.0	11.4
Pasture % Protein	0.0	18.4	0.0	0.0	22.5
Pasture % DM - Concern below 16%	0.0	16.3	0.0	0.0	14.0
Pasture % NDF Concern < 33	0.0	33.0	0.0	0.0	39.7
Mowed pre or post grazing YTD	0.0	4.0	7.3	22.1	0.0
Total area mowed YTD	226.9	230.9	246.1	268.2	268.2
Supplements fed to date kg per cow (555peak)	93.7	93.7	93.7	93.7	93.7
Supplements Made Kg DM / ha cumulative	0	0	0	84.5	84.5
Units N applied/ha and % of farm	25units/19.5 %	25units/21.2 %	25units/18.3 %	25units/21.8 %	25units/21.8 %
Kgs N to Date (whole farm)	113	120	123	127	133
Rainfall (mm)	1	4	0	0	8.8
Aquaflex topsoil relative to fill point target 60 - 80%	70-80	70-80	60-80	60-80	70-80