SIDDC

South Island Dairying Development Centre

Leading tomorrow's dairy farming practices.

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JULY 2018

LUDF

Benchmark Farm

Comparison Information

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LINCOLN UNIVERSITY DAIRY FARM

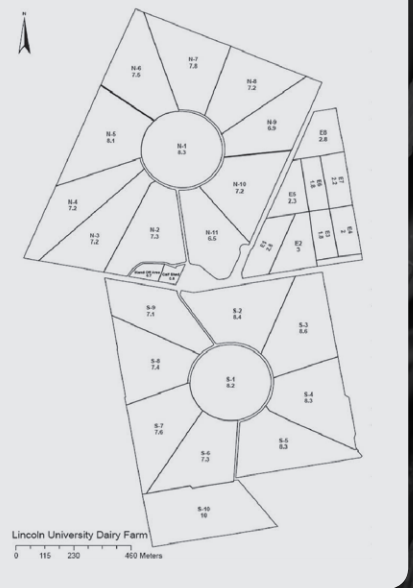
FOCUS DAY
JULY 2018

STAFF

Peter Hancox	– Farm Manager
Tom Chapman	– 2IC
Erica Taylor	– Dairy Assistant
Charlotte Munnik	– Dairy Assistant

LUDF HAZARDS NOTIFICATION

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



Partners Networking To Advance South Island Dairying

Lincoln University
Te Whare Wānaka o Aoraki
AOTEAROA • NEW ZEALAND
New Zealand's specialist land-based university

DairyNZ

ravensdown

LIC

Plant & Food RESEARCH
RANGAHAU AHUMĀRA KAI

agresearch

SIDE
SOUTH ISLAND DAIRY EVENT

INTRODUCTION

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

STAGE 1: 2001/2 AND 2002/3

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

STAGE 2: 2003/4 THROUGH TO 2010/11

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

STAGE 3: 2011/12 TO 2013/14

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

STAGE 4: CURRENT

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

LUDF STRATEGIC OBJECTIVE:

To maximise sustainable profit embracing the whole farm system through increasing productivity;

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

ADDITIONAL OBJECTIVES

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

2. To ensure optimal use of all nutrients on farm, including effluent, fertiliser, nutrients imported from supplements and atmospheric nitrogen; through storage where necessary, distribution according to plant needs and retention in the root zone.

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

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

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

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

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

ONGOING RESEARCH

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

CLIMATE

Mean Annual
Maximum Temperature
32° C

Mean Annual
Minimum Temperature
4° C

Average Days of Screen Frost
36 Days per annum

Mean Average Bright Sunshine
2040 Hours per annum

Average Annual Rainfall
666 mm

SOIL TYPES

Free-draining shallow stony soils
(Eyre soils) **5**

Deep sandy soils
(Paparua and Templeton soils) **45**

Imperfectly drained soils
(Wakanui soils) **30**

Heavy, poorly-drained soils
(Temuka soils) **20**

FARM AREA

Milking Platform **160 ha**

Runoff [East Block] **15 ha**

Unproductive land on platform **6.7ha**

SOIL TEST RESULTS AND FERTILISER APPLICATIONS

Target Soil Test Ranges:

pH: **5.8 – 6.2**

P: **30 – 40**

K: **5 – 8**

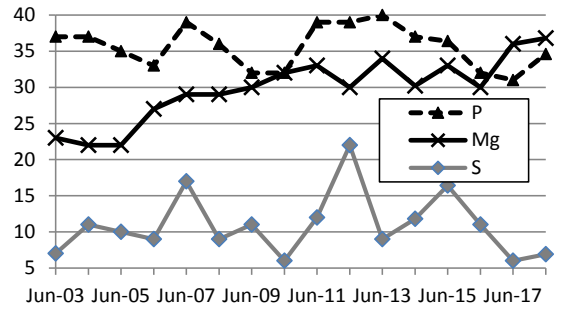
S: **10 – 12**

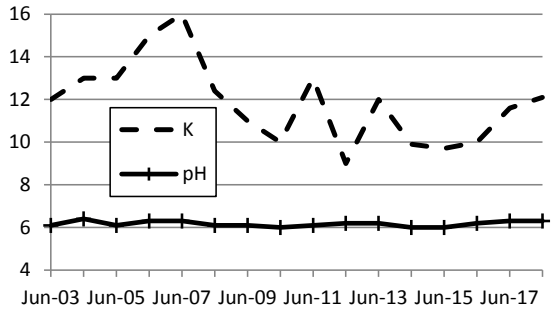
Mg: **20+**

PASTURE

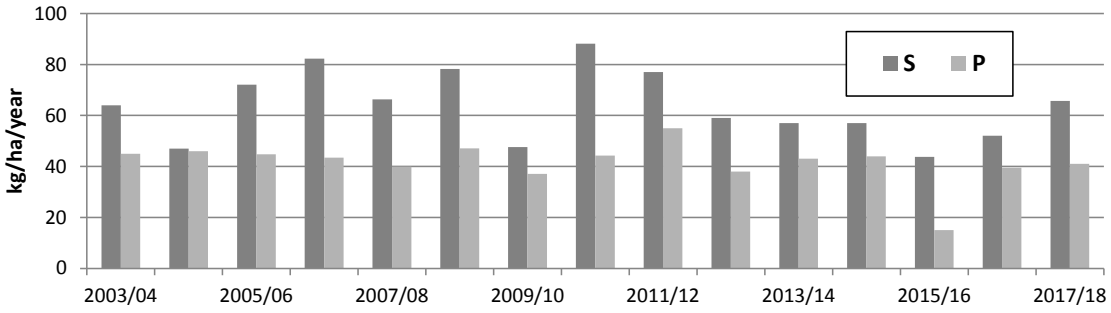
The milking platform was sown at conversion [March 2001] in a mix of 50/50 Bronsyn/ Impact ryegrasses with Aran and Sustain white clovers, and 1kg/ha of Timothy.

LUDF SOIL TEST RESULTS





P AND S APPLICATIONS 2003/04 - 2017/18



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

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

STAFFING AND MANAGEMENT

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

IRRIGATION AND EFFLUENT SYSTEM

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

A full rotation completed in 20.8 hours for 5.5 mm [at 100% of maximum speed].

- Average Annual Rainfall = 666 mm. Average irrigation input applies an additional 450 mm.
- Average Evapotranspiration for Lincoln is 870 mm/year.

EFFLUENT

- Sump capable of holding 33,000 litres and a 300,000 litre
- enviro saucer.
- 100 mm PVC pipe to base of North Block centre pivot,distribution through pot spray applicators via separate line underneath the pivot
- Effluent area - 34 ha

MATING PROGRAMME – SPRING 2017

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

MA cows – sexed semen for 1 week prior to normal PSM. 3 weeks Forward Pack Premier Sires then Short Gestation Dairy and natural mating weeks 7-11.

Heifers to start calving 2 weeks prior normal start mating.

HERD DETAILS – APRIL 2018

Breeding Worth (rel %) 103 / 47
Production Worth (rel%) 131 / 67
Recorded Ancestry 99%

Average weight / cow - Herd monitored walk over weighing 481 kg [Dec 2017]

Predicted Calving start date - 2018
Heifers 14 July, Herd 25th July

Est. Mean calving date
9 August 2018

Mating start date
18 October 2017 (heifers 7 days earlier)

Empty rate after 11 weeks mating - 19%
(2017-18 mating). 6 week in-calf rate 66%.

	2002/03	Average 03/04-06/07	Average 07/08-10/11	Average 11/12-12/13	2013/14	2014/15	2015/16	2016/17	2017/18
Total kg/MS supplied	228,420	277,204	269,512	299,112	276,019	278,654	289,906	286,189	251,424
Average kg/MS/cow	381	425	401	474	440	498	522	516	451
Average kg/MS/ha	1414	1720	1,685	1,870	1725	1742	1812	1789	1571
Farm Working Expenses / kgMS	$2.98	$2.68	$3.62	$3.88	$4.28	$3.87	$3.47	$3.76	$4.15
Dairy Operating Profit/ha	$1,164	$2,534	$5,426	$4,609	$7,578	$1,200	$1,182	$4,728	$4,070
Payout [excl. levy] $/kg [Milk price + div.]	$4.10	$4.33	$6.85	$6.28	$8.50	$4.65	$4.30	$6.52	$6.85
Return on Assets	4%	6%	9%	6%	10%	2%	2%	7%	6%
1 July cow numbers	631	675	697	658	650	580	578	580	579
Max. cows milked	604	654	673	631	628	560	555	554	558
Herd average Days in milk			264	273	259	263	267	270	264
Stocking rate Cow equiv. / ha	3.75	4.05	4.2	3.9	3.92	3.5	3.47	3.46	3.49
Stocking rate - Dec liveweight - kg / ha	1,838	1964	2,005	1,869	1872	1680	1724	1700	1680
Dry Cow Grazing off - Dairybase (tDM/ha)			3	3	3.9	3.2	3.5	3.2	2.8
No. Yearlings (all grazed off farm)	118	157	174	140	140	126	126	133	140
No. Calves (all grazed off farm)	141	163	181	173	150	126	155	150	140
Past Eaten (Dairybase) (tDM/ha)			17	17	14.9	15.7	16.6	16.0	14.6
Purch. Suppl - fed [kgDM/cow]	550	317	370	397	507	300	126	397	445
Supp Made on dairy/platform [kgDM/cow]	0	194	116	124	0	40	277	104	88
Applied N / 160 eff. Ha			202	345	250	143	179	173	178

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LUDF FARM SYSTEM OVERVIEW:

STRATEGIC OBJECTIVE

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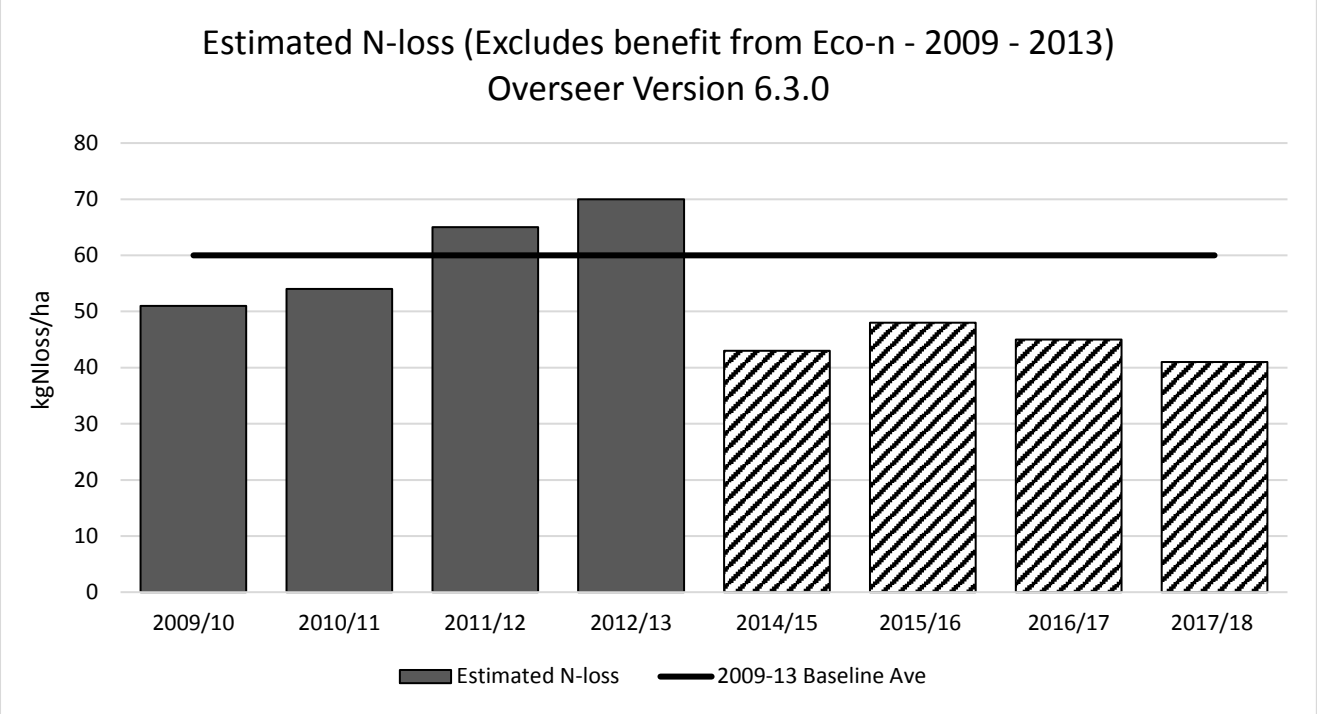
To achieve the above objectives, and considering the changing environmental regulations to reduce nutrient losses, LUDF has since the beginning of the 2014/15 season adopted and scaled up research emerging from the P21 Phase 2 programme. This research (jointly funded by the Ministry of Business, Innovation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

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

	Average 11/12 - 13/14	**Average 14/15 - 16/17**	**2017-18**
Peak cows milked	**631**	**557**	**558**
Stocking Rate	**3.9**	**3.5**	**3.5**
Total kgMS sold	291,414	284,916	251,424
Per Cow Milk Production	463	512	451
Milk Production /ha	1821	1781	1571
Total N fert applied kgN/ha	313	165	178
Total Imported Silage Fed tDM	273	153	248
Total Imported Silage Fed (kgDM/peak cow)	433	274	445
December Liveweight	475	490	481
kgMS/kg LWT	97%	104%	94%
Farm Working Expenses	$4.01	$3.70	$4.15
Overseer Est kgN Leached/ha (vers 6.3.0)	61	45	41
Total GHG emissions (CO2 eq kg/ha/yr)	17,471	15,392	13,861

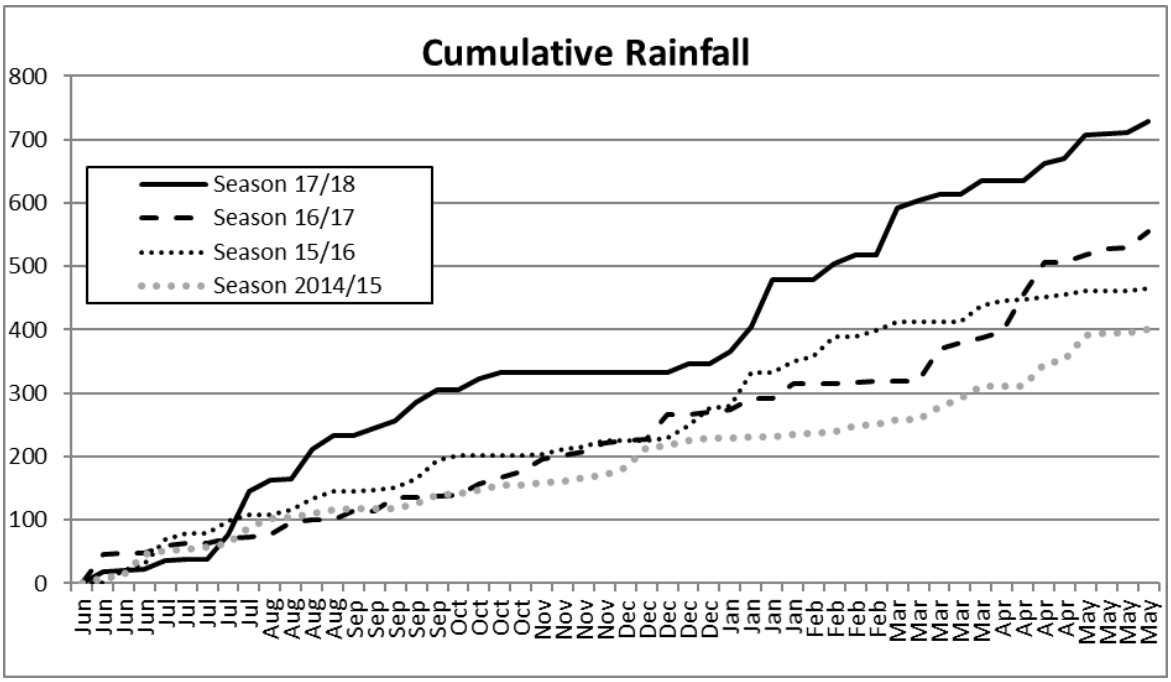
As seen in the summary of results above, LUDF has reduced its imported feed and N-fertiliser use, and through better matching of its stocking rate to feed supply, largely maintaining profitability. Estimated N-losses from Overseer® are shown below.



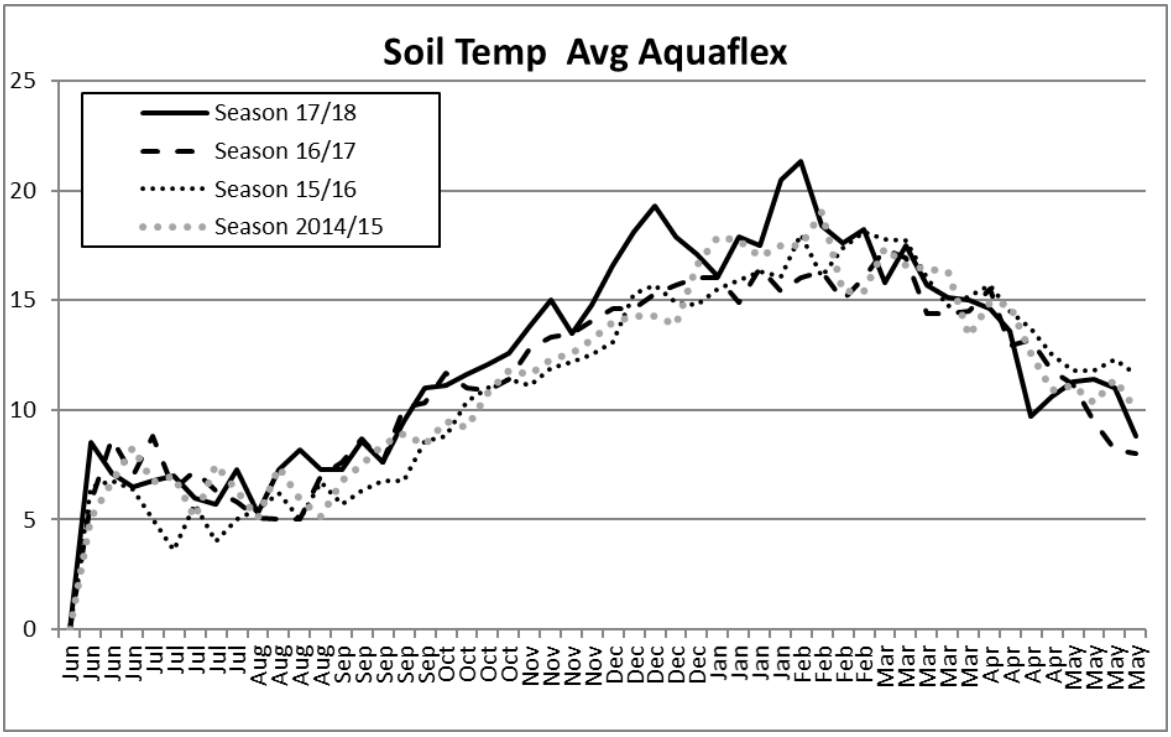
The modelled N-leaching losses (predicted using Overseer) for 2017-18 season is 32% below the farms 2009-2013 N-baseline.

LUDF – SEASONAL OVERVIEW

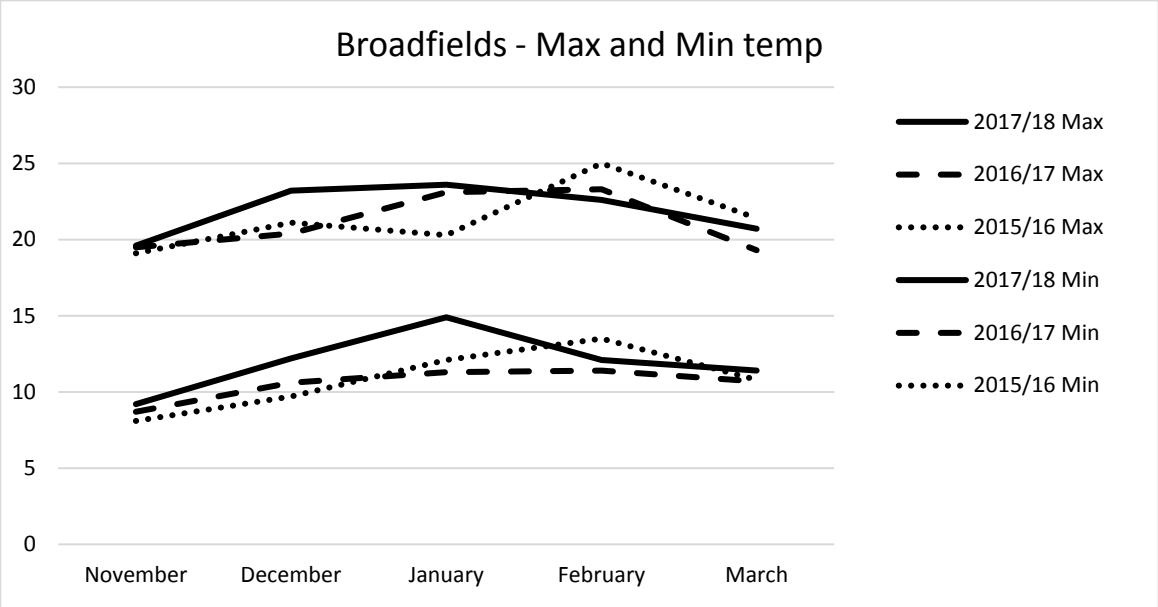
The 2017-2018 season has been characterized by somewhat extreme weather patterns, starting with a very wet July/August, making calving a challenge and followed by very hot and dry November/December with intermittent rainfall events from January onwards. These rainfall event were 2-3 days long each time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

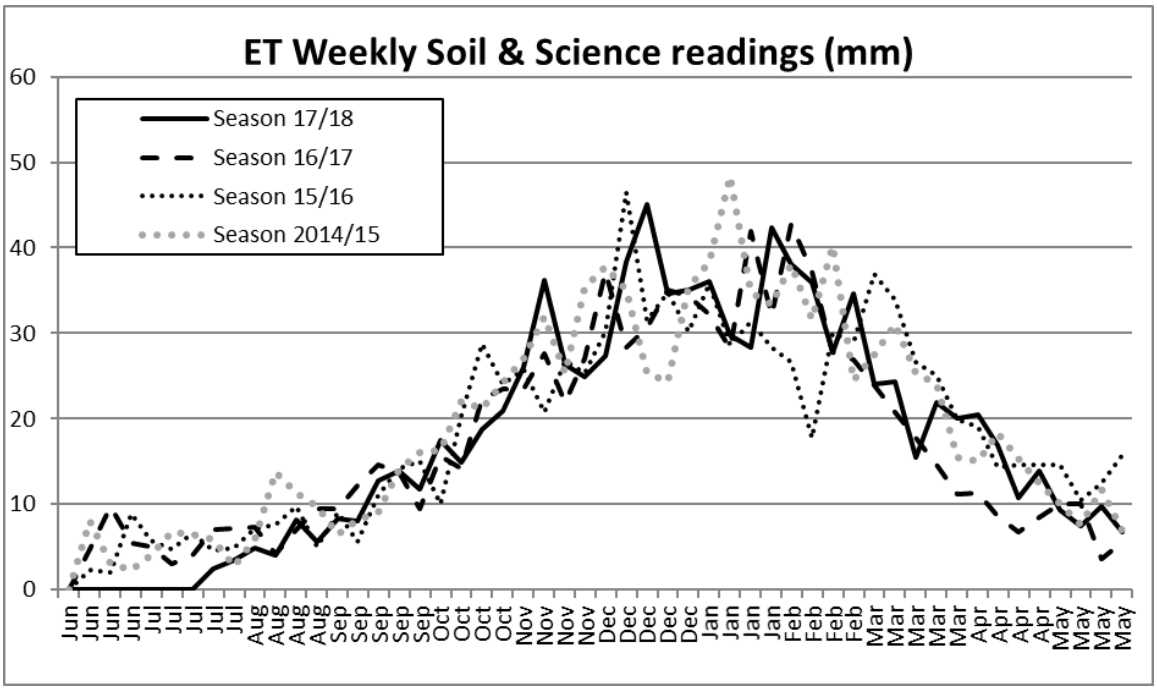


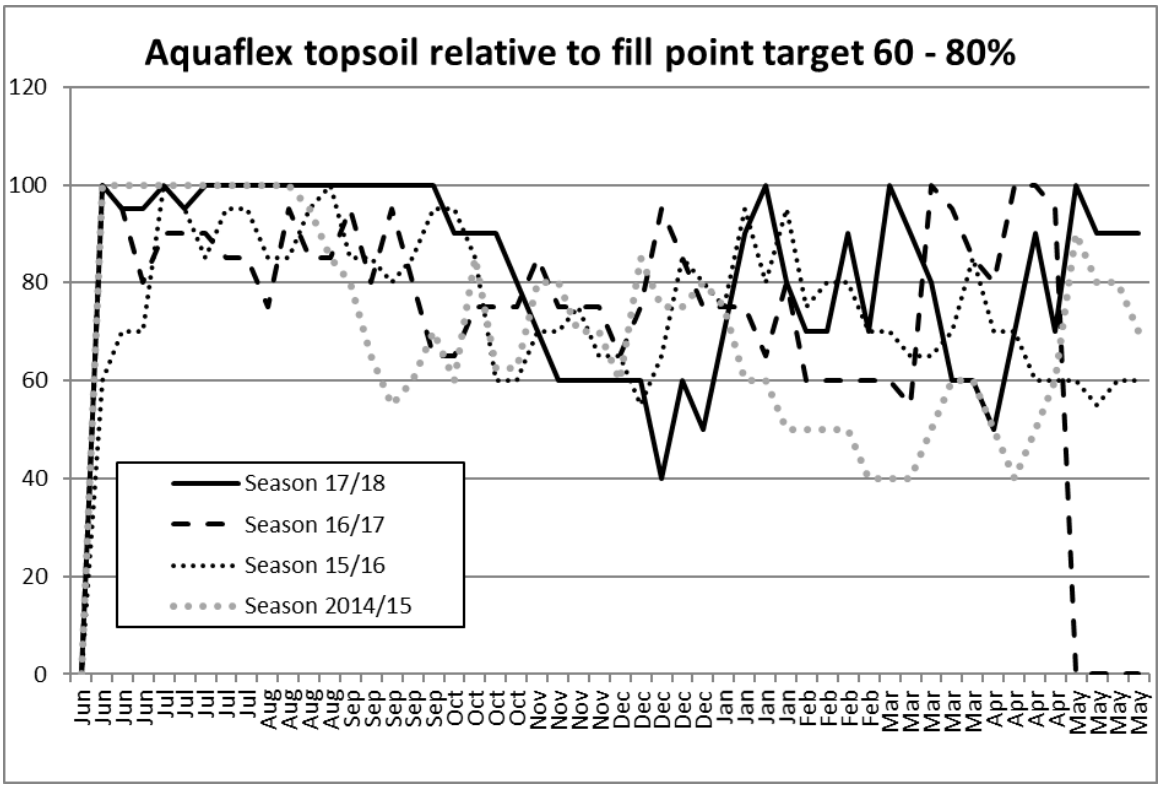
Note the average annual rainfall for LUDF is approximately 600 mm/yr.



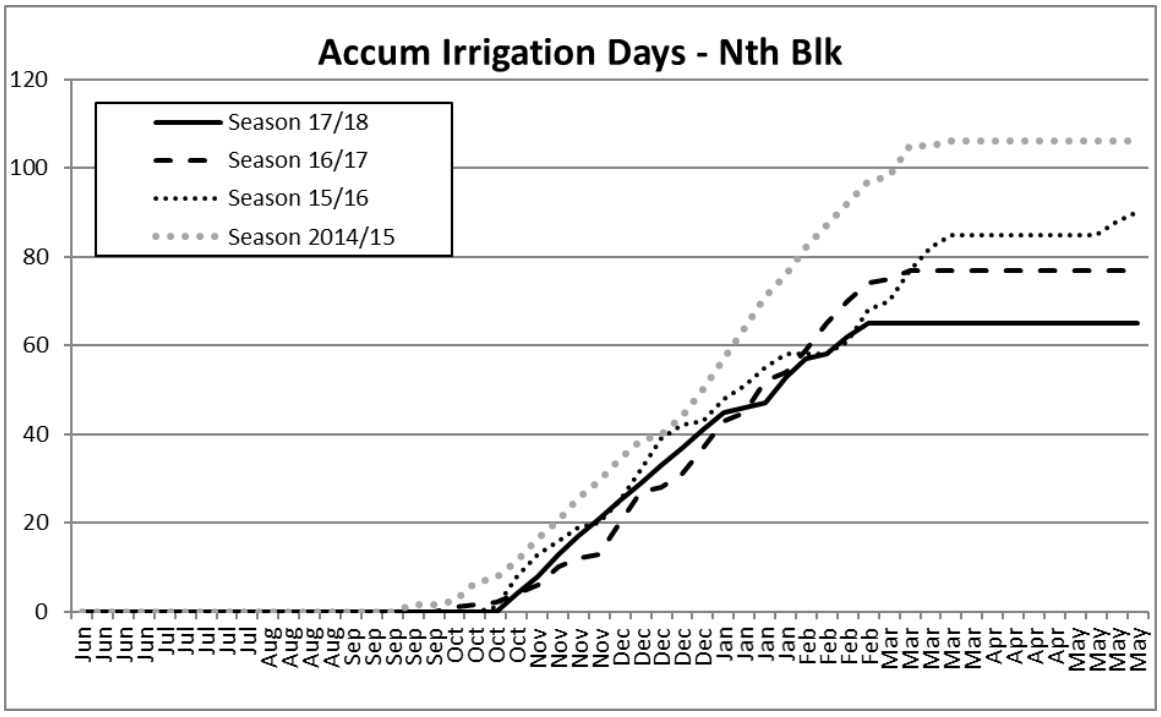
The high soil temperatures during November through to January are in part the result of much higher night time temperatures. Higher night time temperatures and high daytime temperatures increased evapotranspiration (ET) rates as plants use more moisture in the warmer weather.







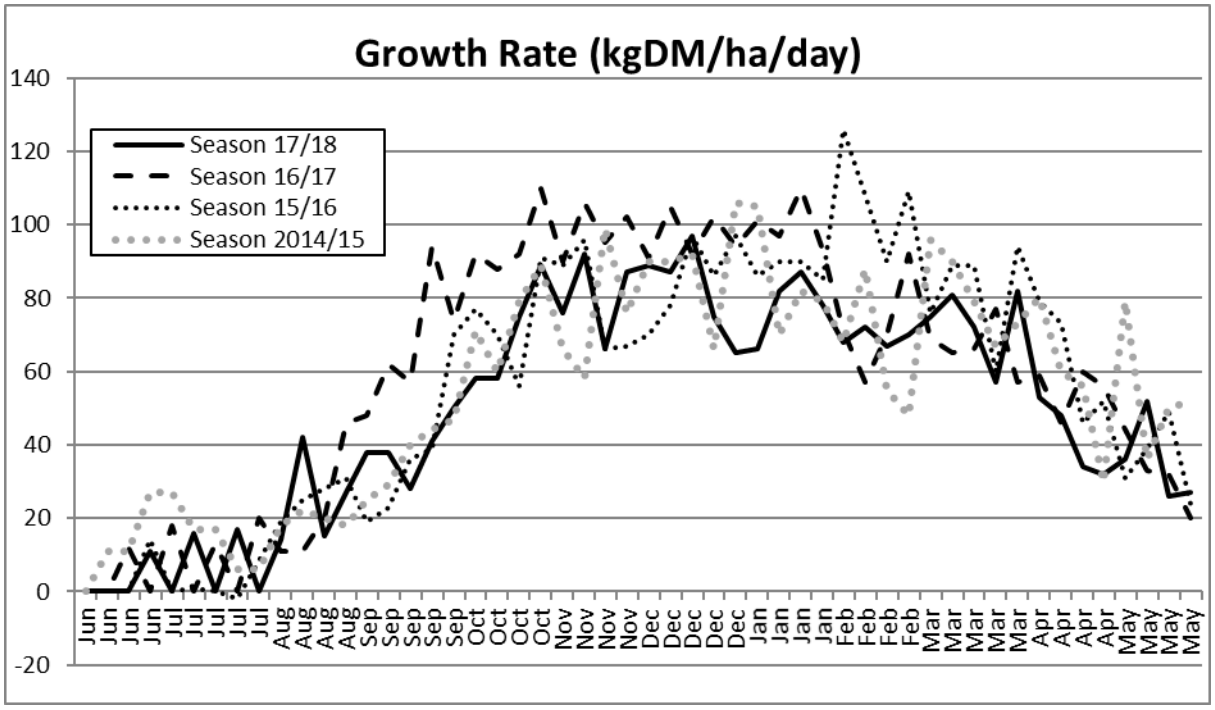
The irrigation infrastructure on LUDF can apply up to 35mm irrigation water / week (in applications of 5mm/day) so cannot maintain soil moisture levels when ET is above 35mm/week. Added to this, ongoing technical malfunctions on the north block pivot resulted in the machine frequently stopping (going out on "safety"), limiting the farms ability to maintain adequate irrigation applications.

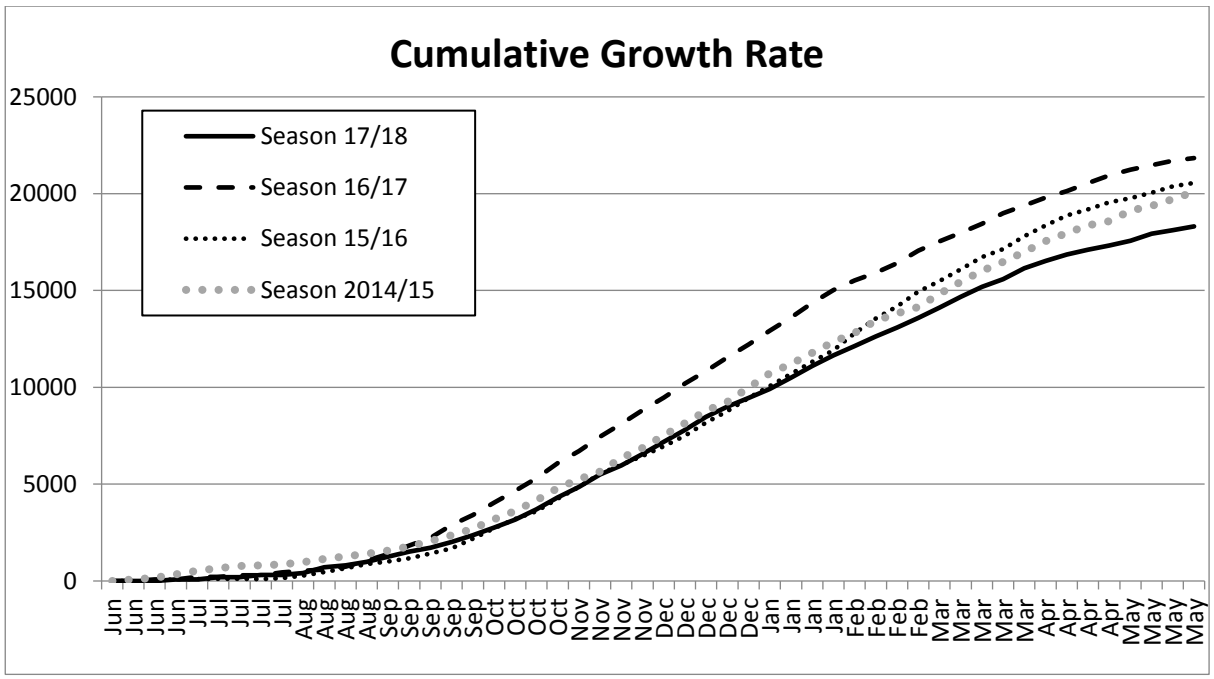


Fortunately, the large rainfall events since late December restored soil moisture to optimal levels. The overall reduction in cumulative irrigation days is primarily the result of the irrigation breakdowns limiting the ability of the farm to irrigate.

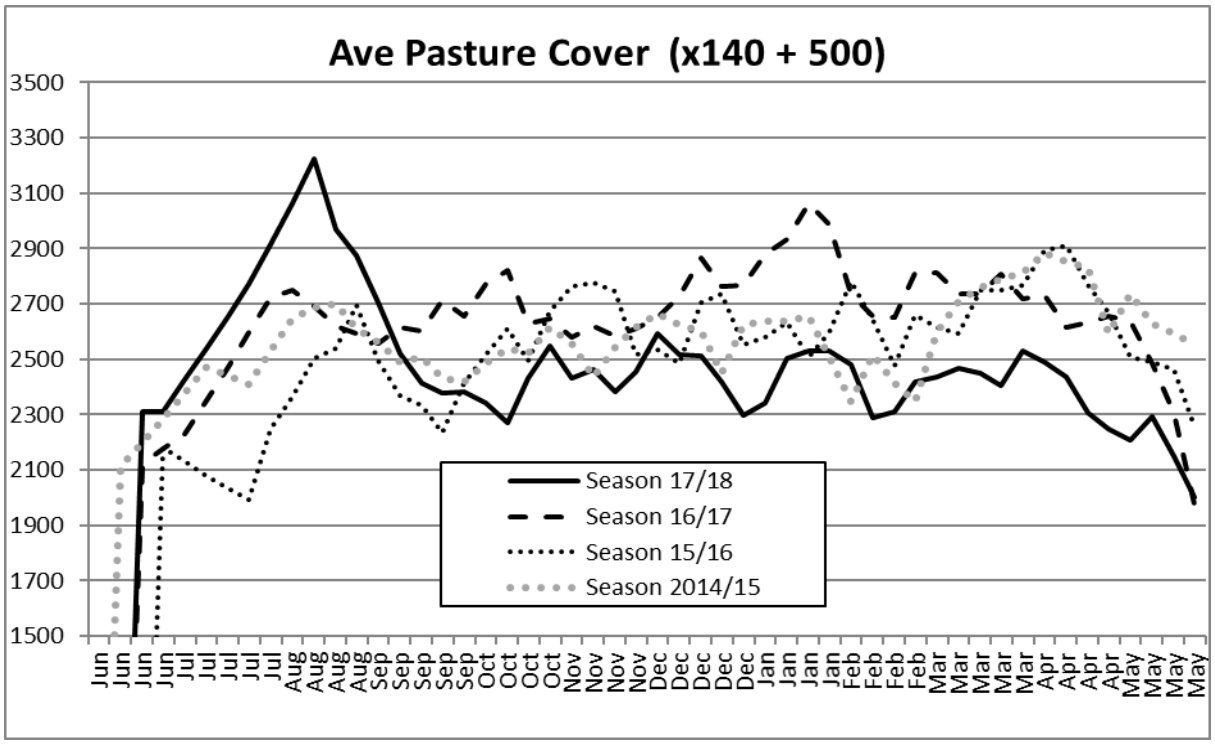
Rising Plate Meter Yield Estimates, Growth Rates and Average Pasture Cover

The graphs below show the impact of the challenging season in terms of growth rates. LUDF's pastures really struggled through the high heat of the season (November/December and February). This has resulted in less pasture being grown (and harvested) and more supplements being used compared to previous seasons.

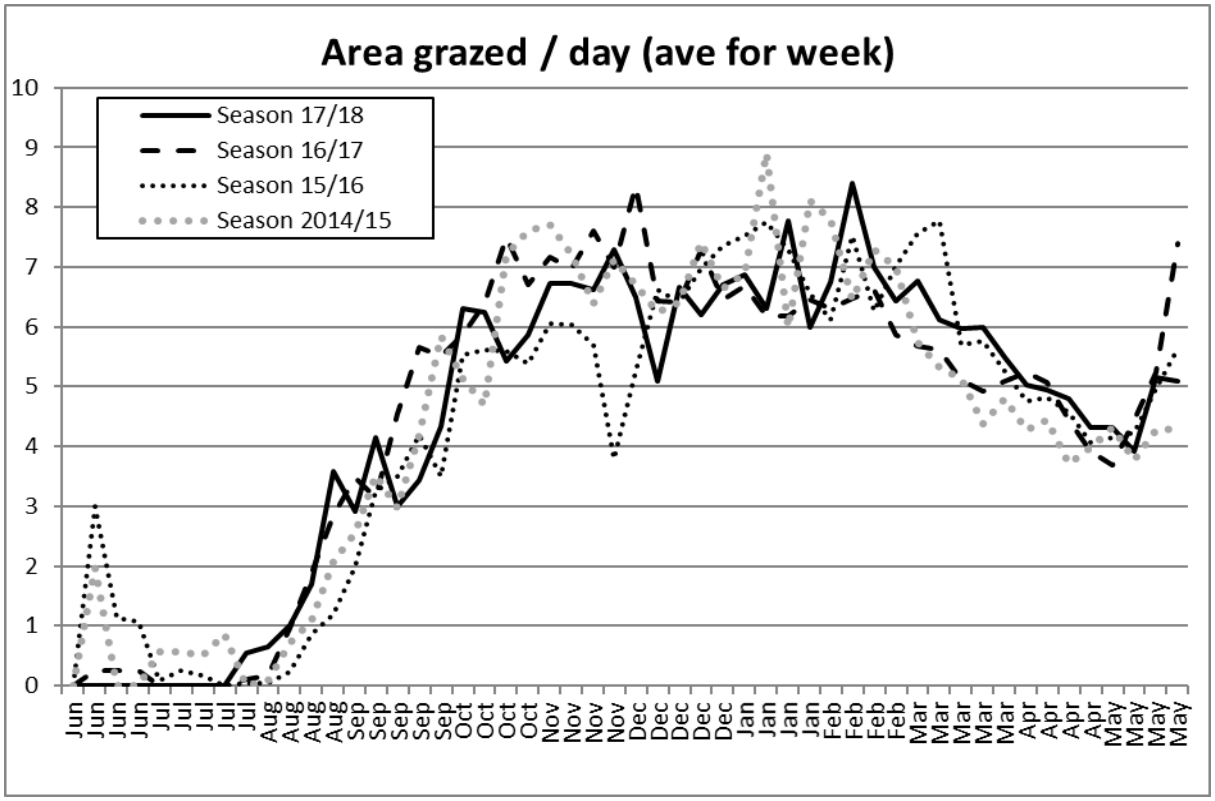




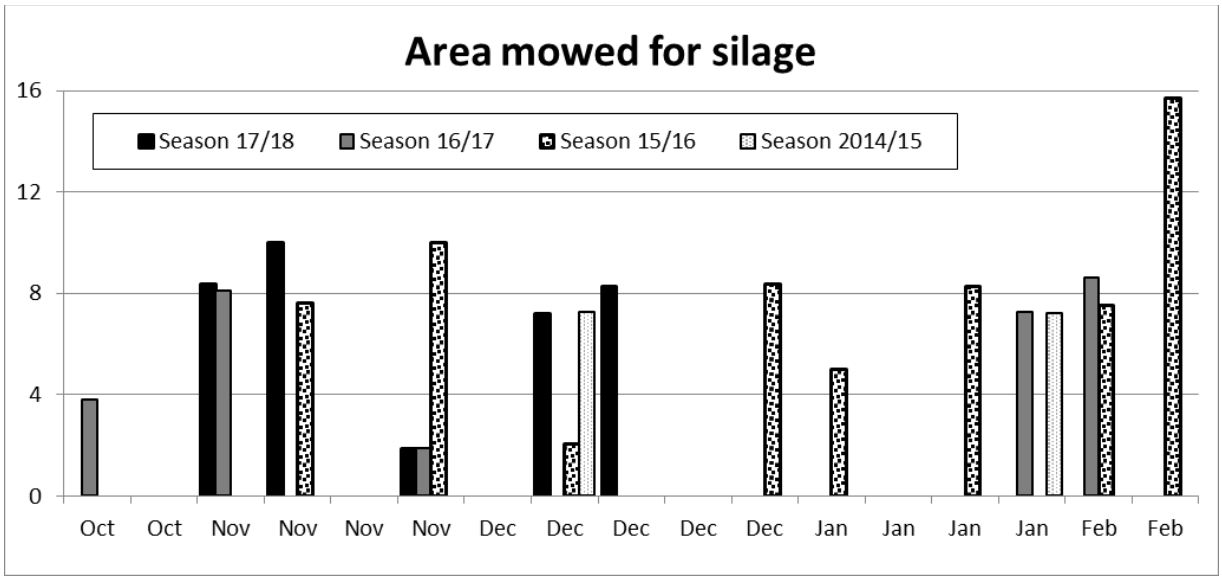
Cumulative growth rates are based on the weekly growth rate data above, but as noted in the farm walk notes during the season, weekly growth rates measured with the Rising Plate Meter often over estimated that which was apparent when calculating growth rate based on intake and change in average pasture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

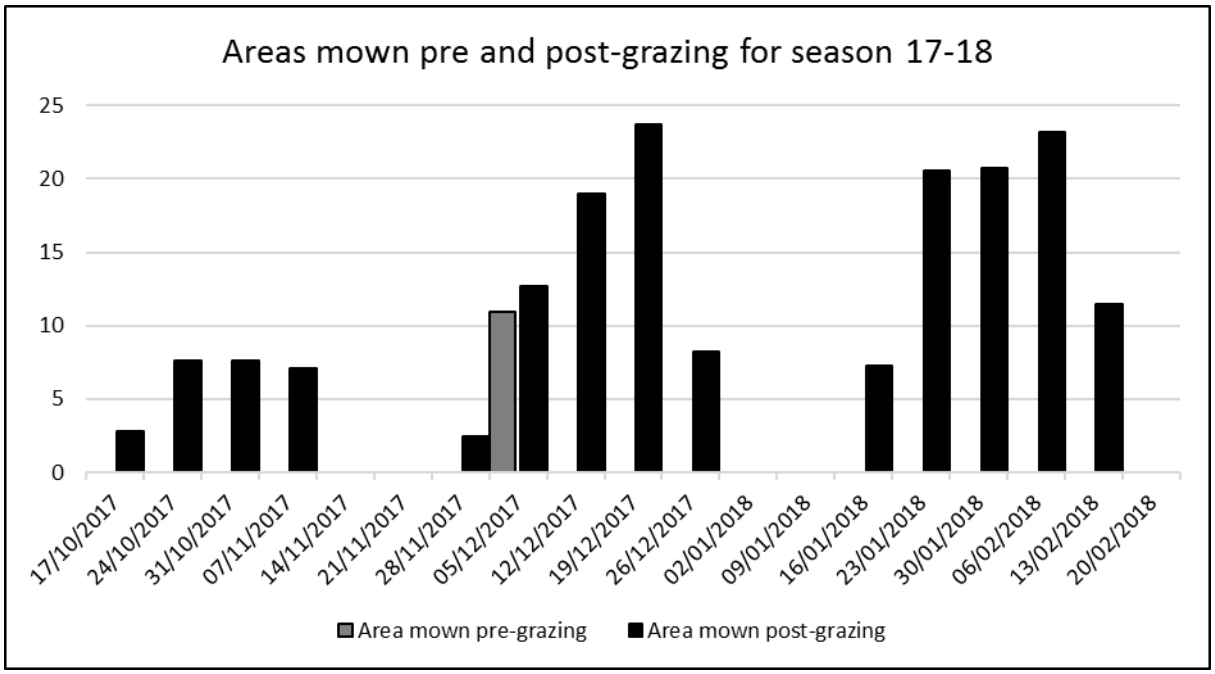


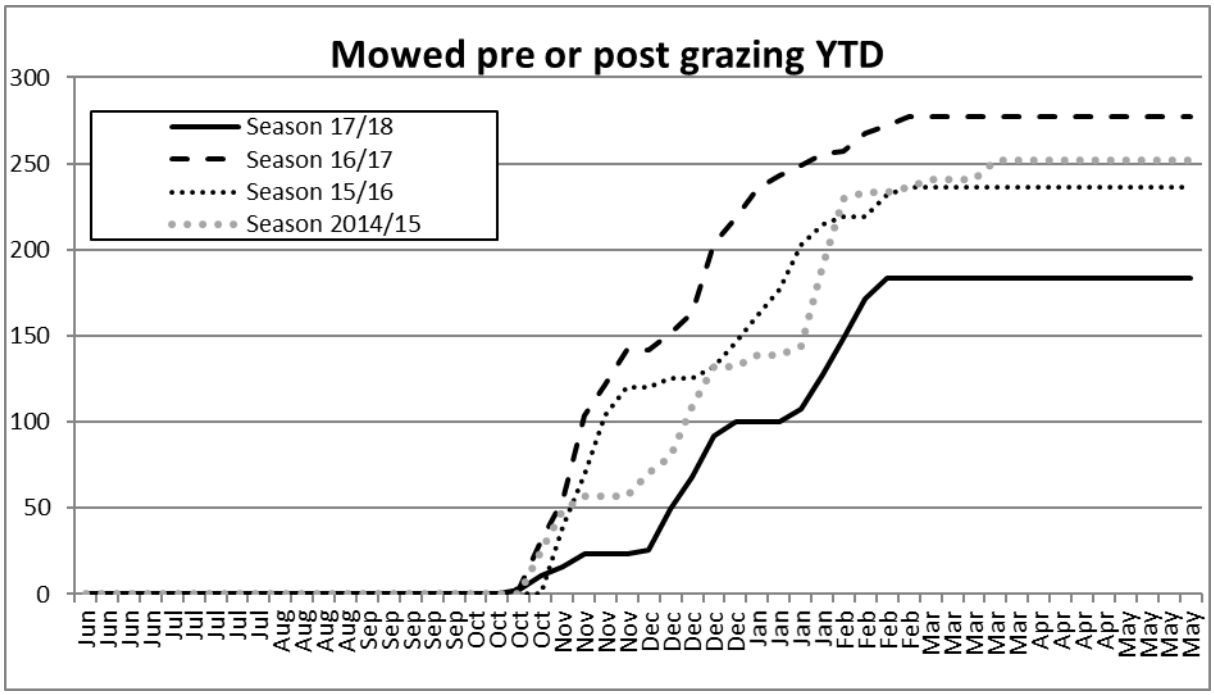
In terms of pasture management, utilisation was the challenge during the wet start of the season. It was not possible to entirely follow the Spring Rotation Planner and residuals were not always achieved, particularly as pregraze covers were approximately 4000kgDM/ha for much of the first grazing round.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

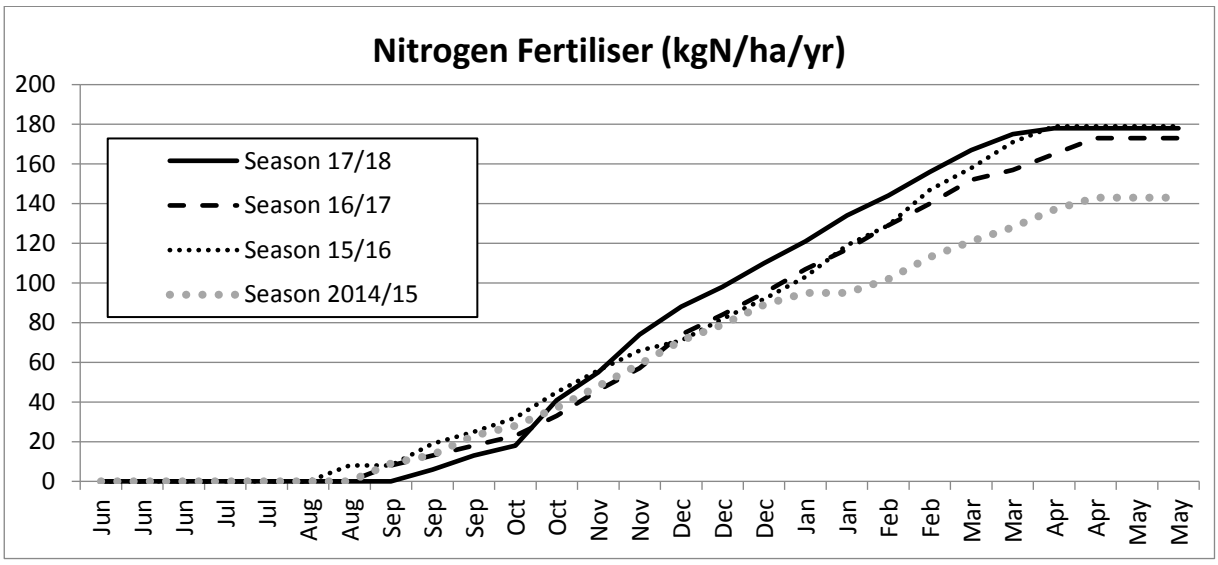


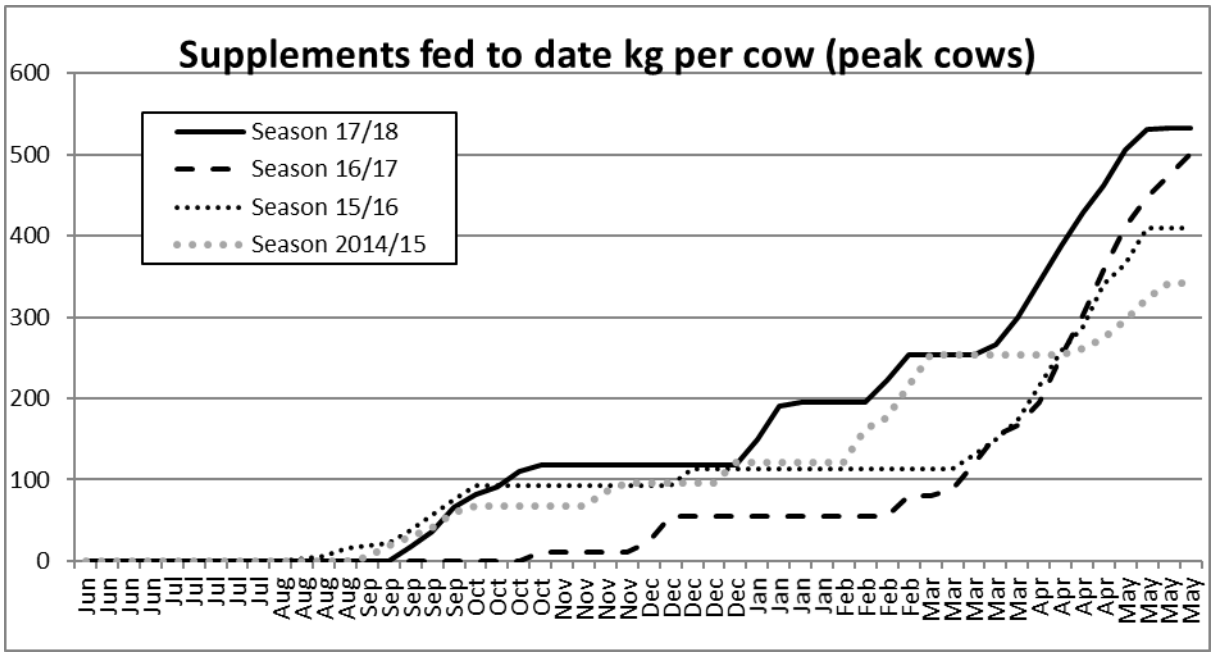
Maintaining high quality pasture to the base of the sward was a consistent challenge after the first grazing, with some paddocks unable to be tidied up for the next couple of grazings due to intermittent rainfall events. These paddocks were managed with the harvesting of some silage (with early surpluses) and by mowing post-grazing rather than pre-grazing when conditions allowed this. Following the wet start to the season, the dry hot conditions during November-December meant that seed head was fast to appear, and hard to control with 24 day grazing rounds. Seed head appearance continued through multiple grazings, well into January. The autumn was better in term of growing conditions with good amount of sunshine and enough rain and irrigation. The large southerly storm in mid-April resulted in a significant drop in temperature from then onwards.



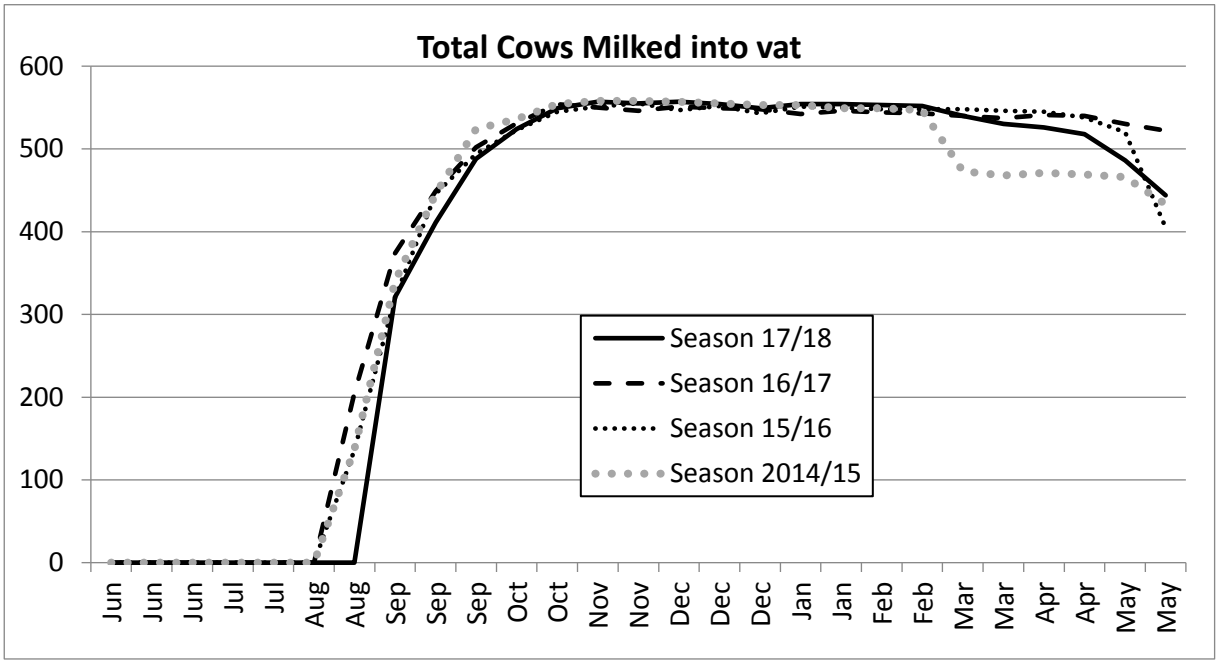


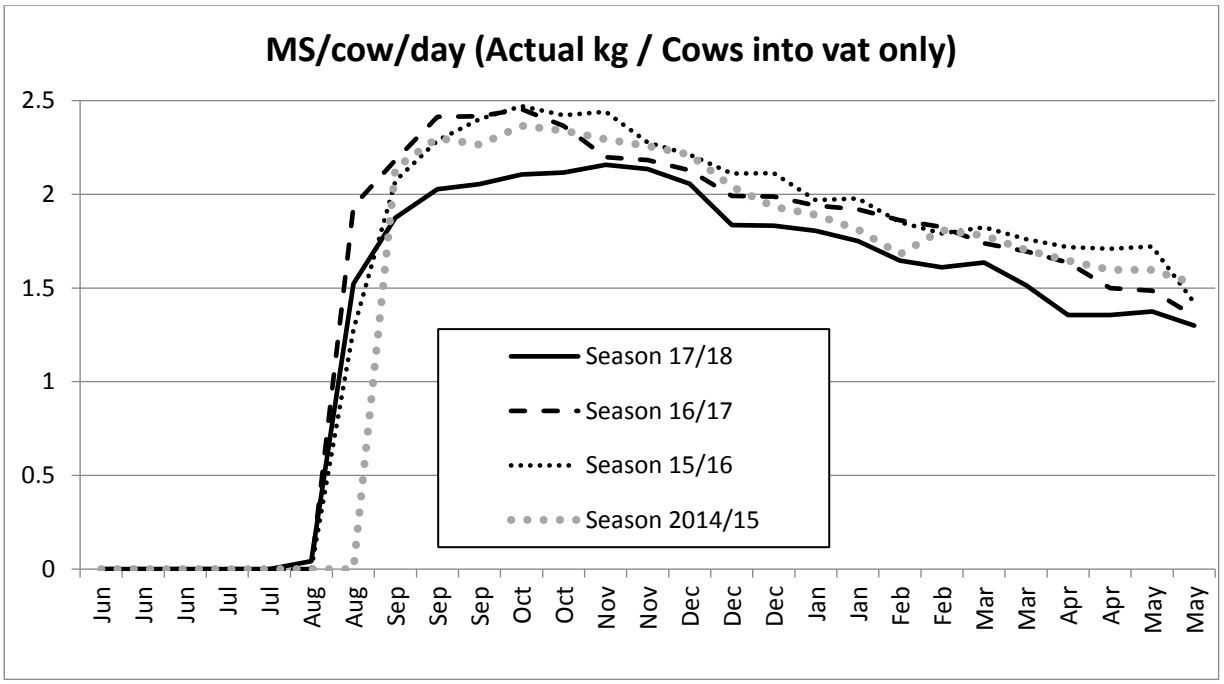

Mowed pre or post grazing YTD
Season 17/18
Season 16/17
Season 15/16
Season 2014/15
300
250
200
150
100
50
0
Jun Jun Jun Jun Jul Jul Jul Jul Aug Aug Aug Aug Sep Sep Sep Sep Sep Oct Oct Oct Nov Nov Nov Nov Dec Dec Dec Dec Dec Jan Jan Jan Feb Feb Feb Feb Mar Mar Mar Mar Apr Apr Apr Apr May May May May


Nitrogen Fertiliser (kgN/ha/yr)
Season 17/18
Season 16/17
Season 15/16
Season 2014/15
200
180
160
140
120
100
80
60
40
20
0
Jun Jun Jun Jul Jul Aug Aug Sep Sep Sep Oct Oct Nov Nov Dec Dec Dec Jan Jan Feb Feb Mar Mar Apr Apr May May



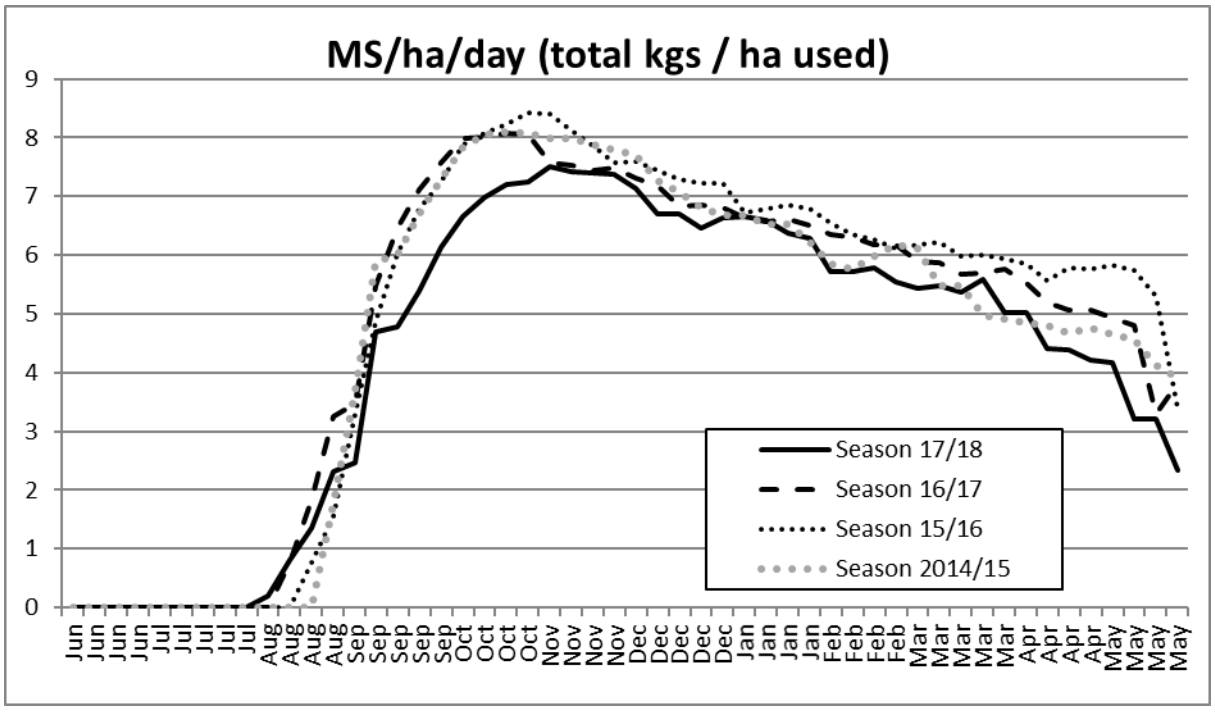
MILK PRODUCTION



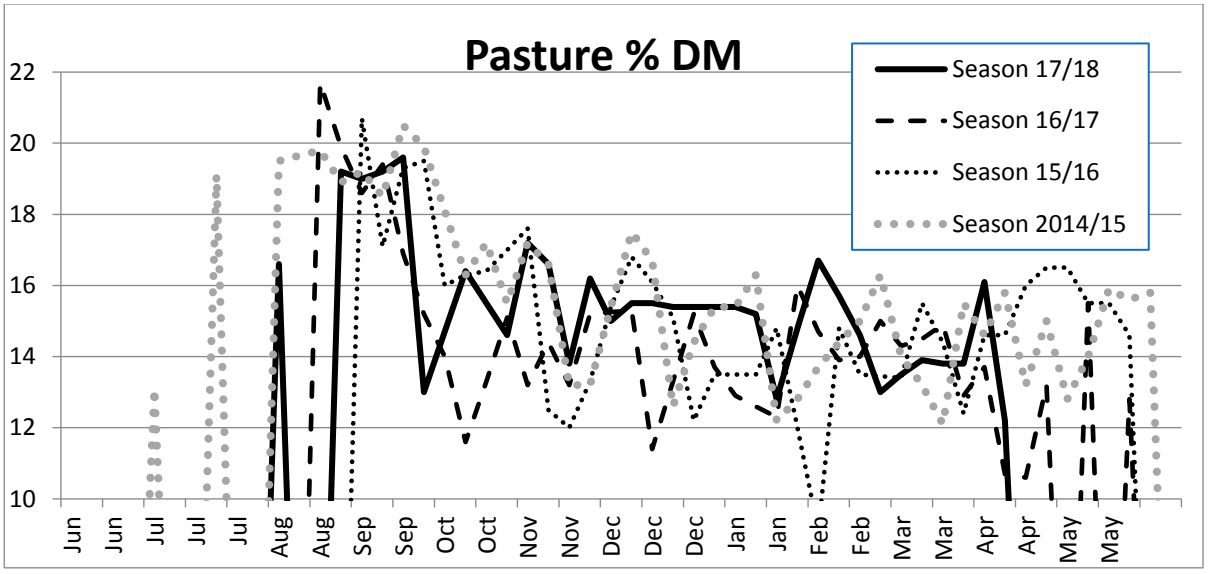


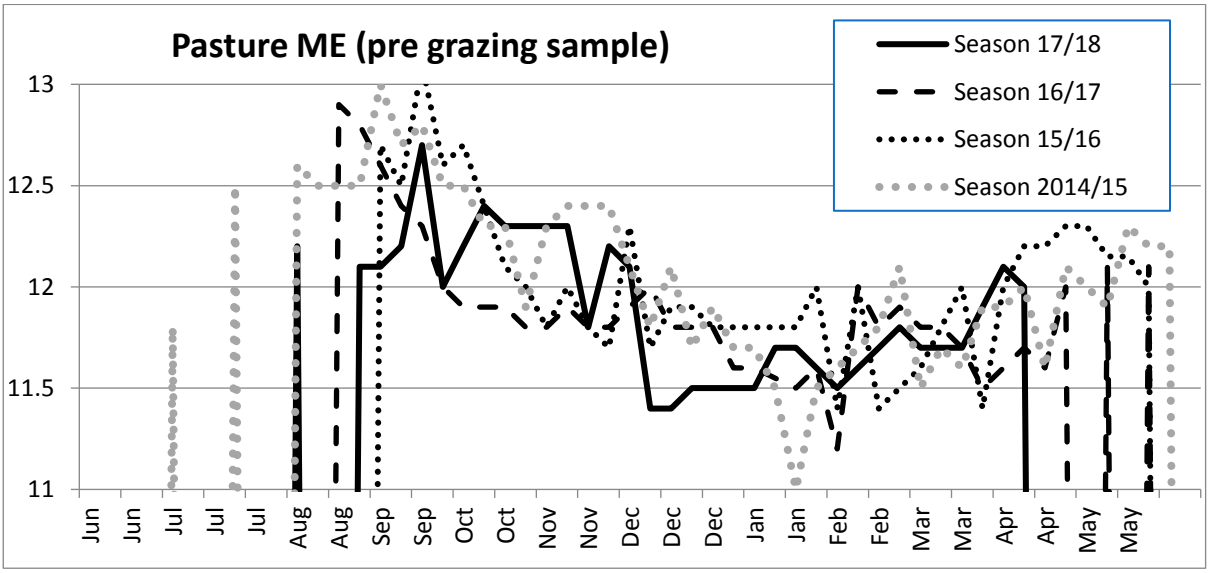
The temperatures experienced also resulted in cows changing their grazing behaviour during the heat of the day and during the thick of the storms. During the heat, cows were more often choosing not to graze, standing by the troughs and in some cases bothered by flies as well as the heat. During the storms,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

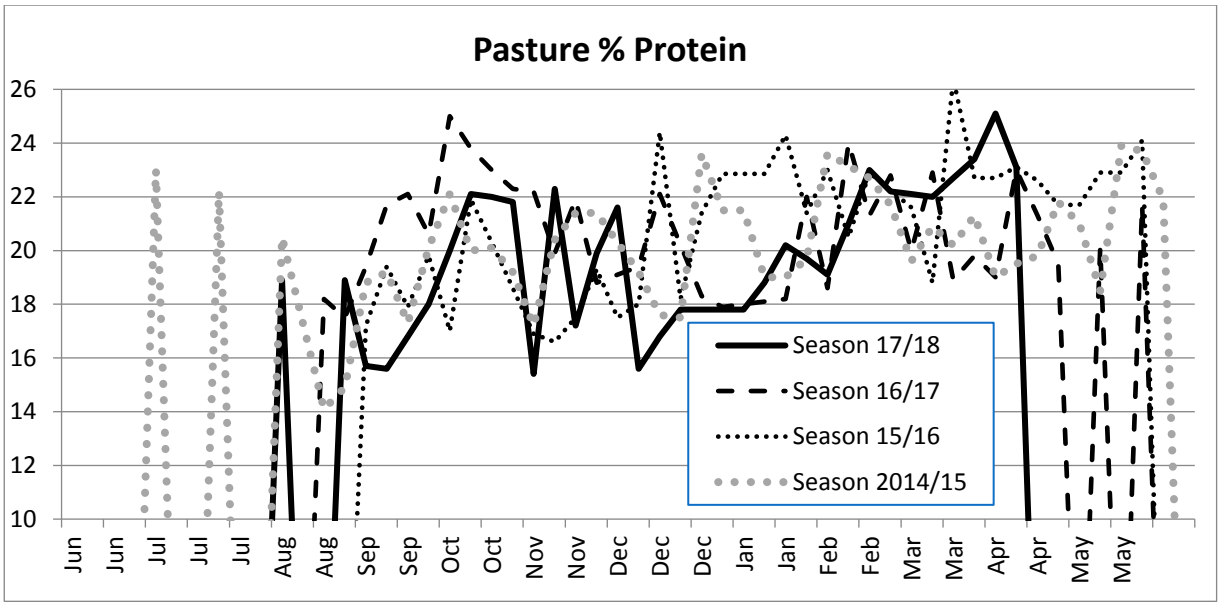
Together with the challenging start to the season and the slower calving spread (as above), it has therefore been difficult to maintain target milk production this season. Clearly cows did not peak as they have in past seasons (see October focus day notes). Production dropped significantly at 2 points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

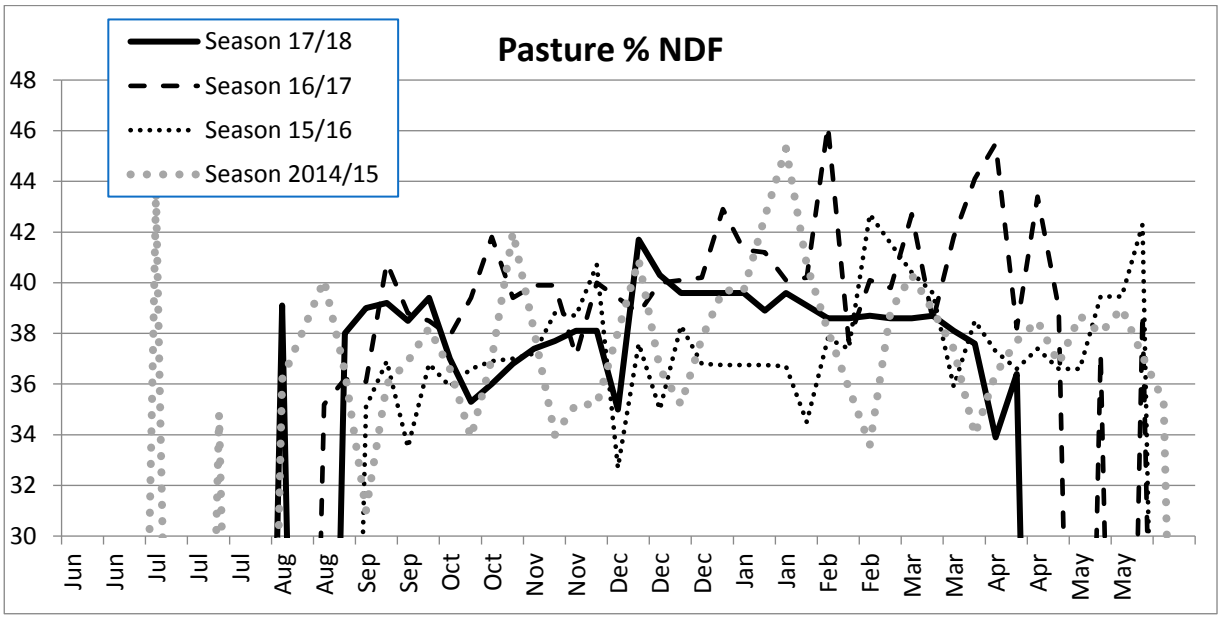


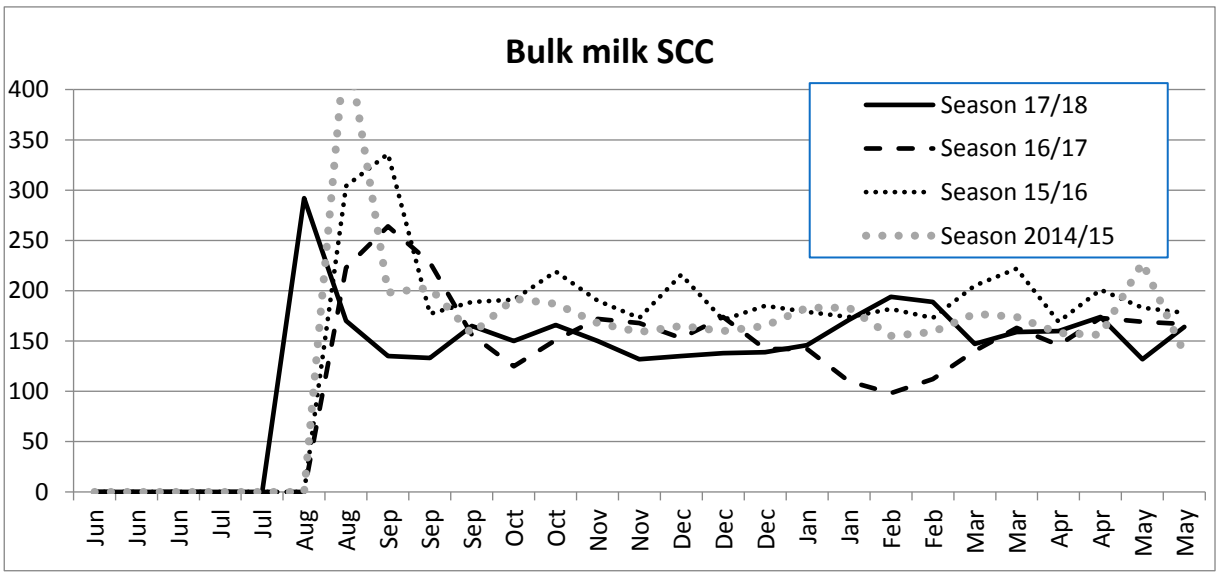
Pasture in the November - December period can be described as low ME, low protein, high DM% and increasing NDF %, with levels improving by February. This coincided with a small loss in BCS in the herd and a drop in milk production, suggesting cows were producing milk while utilizing their reserves rather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



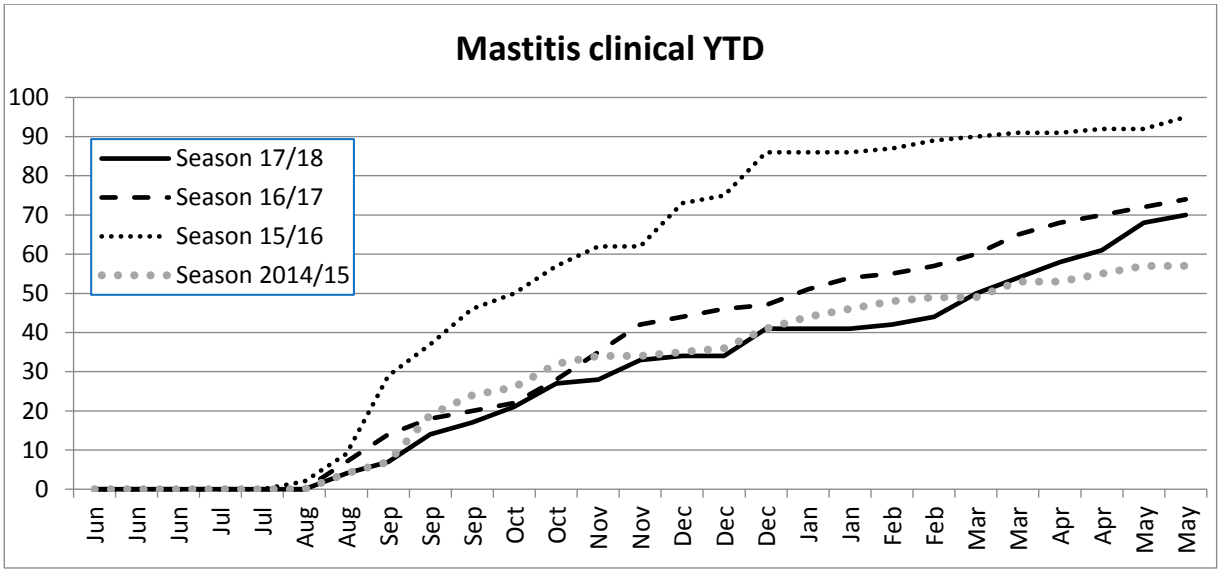


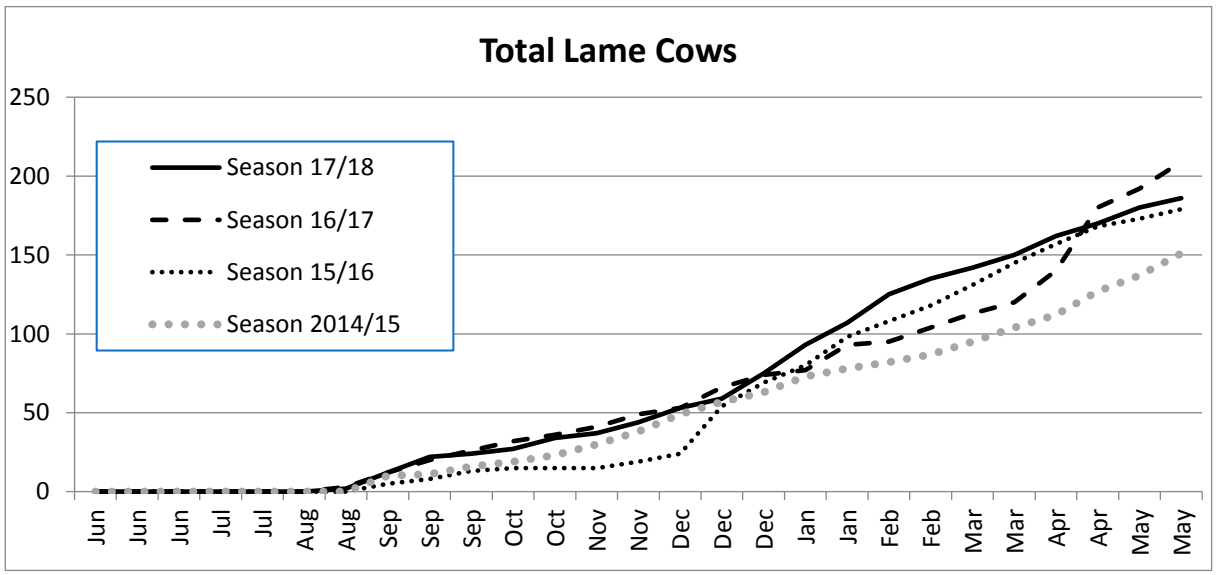

Pasture % Protein
26
24
22
20
18
16
14
12
10
Jun Jun Jul Jul Jul Aug Aug Sep Sep Oct Oct Nov Nov Dec Dec Dec Jan Jan Feb Feb Mar Mar Apr Apr May May
Season 17/18
Season 16/17
Season 15/16
Season 2014/15


Pasture % NDF
48
46
44
42
40
38
36
34
32
30
Jun Jun Jul Jul Jul Aug Aug Sep Sep Oct Oct Nov Nov Dec Dec Dec Jan Jan Feb Feb Mar Mar Apr Apr May May
Season 17/18
Season 16/17
Season 15/16
Season 2014/15

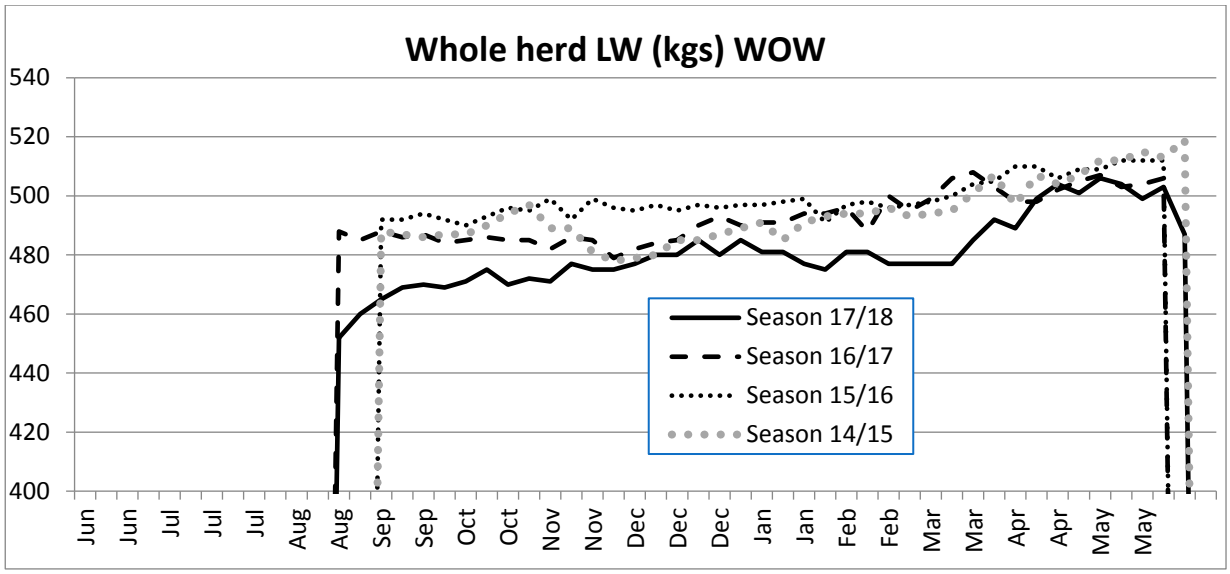

Bulk milk SCC
400
350
300
250
200
150
100
50
0
Jun Jun Jun Jul Jul Aug Aug Sep Sep Sep Oct Oct Nov Nov Dec Dec Dec Jan Jan Feb Feb Mar Mar Apr Apr May May
Season 17/18
Season 16/17
Season 15/16
Season 2014/15

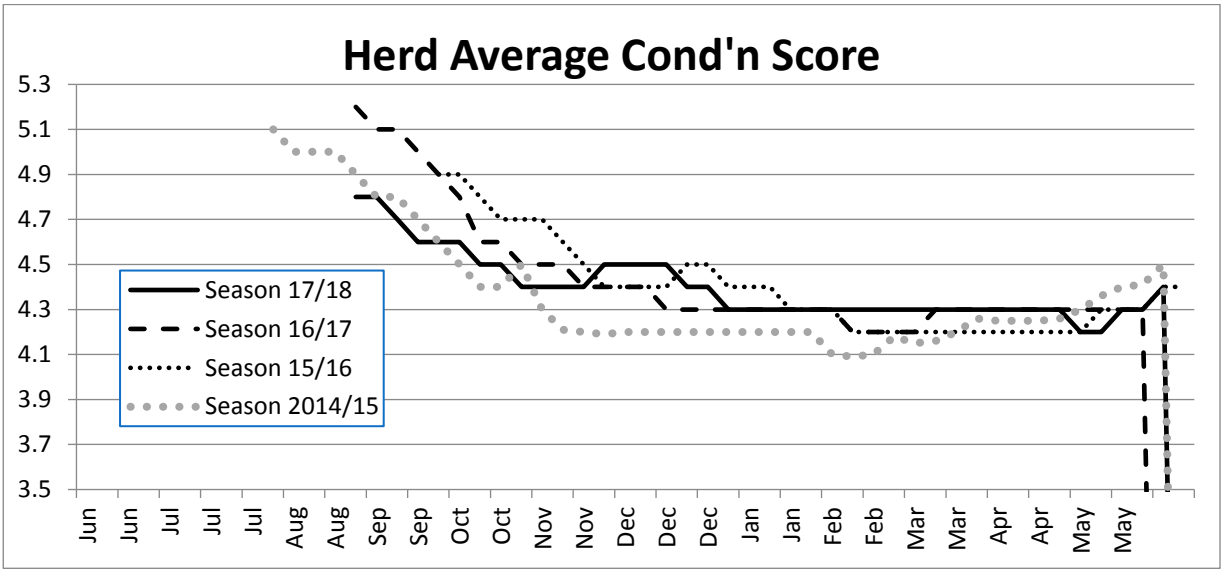
BMSCC were on average the lowest they have been in the past 3 season, except during the February period. Consistent and pro-active observation and identification of animals remains a focus for this farm. The graphs below, show the season-to-date number of mastitis cases treated this season, was the lowest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





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


Whole herd LW (kgs) WOW
540
520
500
480
460
440
420
400
Jun
Jun
Jul
Jul
Jul
Aug
Aug
Sep
Sep
Oct
Oct
Nov
Nov
Dec
Dec
Dec
Jan
Jan
Feb
Feb
Mar
Mar
Apr
Apr
May
May
Season 17/18
Season 16/17
Season 15/16
Season 14/15


Herd Average Cond'n Score
5.3
5.1
4.9
4.7
4.5
4.3
4.1
3.9
3.7
3.5
Jun
Jun
Jul
Jul
Jul
Aug
Aug
Sep
Sep
Oct
Oct
Nov
Nov
Dec
Dec
Dec
Jan
Jan
Feb
Feb
Mar
Mar
Apr
Apr
May
May
Season 17/18
Season 16/17
Season 15/16
Season 2014/15

LUDF PROFITABILITY BENCHMARK - 2017-18 SEASON

SUMMARY OF FARMS:

LUDF

- This is a 160 hectare farm, milking 558 peak cows this season close to the Lincoln Township.
- The milking shed is a rotary shed with 50 cups, automatic cup removers and Protrack
- There is no crop on the milking platform and cows are typically brought back onto platform as calved animals.
- The farm uses a small support block of 14 hectares across the road (East block) to run springers and dry cows during spring and new born calves when taken out of the calves pens, until such time they are sent to their rearing block in Hororata.
- All grazing and silage from this 14ha block is included as purchased feed for the milking platform.
- Dry cows can also be run at a neighbouring property (Jackies) if necessary
- The herd was wintered on fodder beet near Hororata in 2017.
- All off-platform grazing is accounted for as replacement / cow grazing days off platform and shown in the expenses as a cost at market rates.
- The farm runs a simple system where all supplements are in the form of grass silage, though fodder beet was been used in the autumn in the previous season
- Irrigation is primarily with 2 pivots and sprinklers (in the corners); water is sourced from 2 bores and effluent is applied through a separate line under the north block pivot.
- The herd has been using whole herd parentage testing for a number of years and testing and culling for Johne's disease for the past four autumns.

Davie-Martin

- This is 141 ha platform milking 540 peak cows through a 40 aside herring bone shed with protrack installed in May 2018.
- This business has an associated 90 ha leased support block that provides supplements and grazing for the milking platform.
- Irrigated mainly with pivots, the water is sourced from the Hurunui River
- The season 2017/18 season was challenging to manage with early water restrictions from mid-December and higher temperatures than usual during the summer months.

Dry Creek

- This is 153.5 ha self-contained farm milking 531 peak cows through a 44 aside herringbone shed with cup removers and protrack.
- 11.5 ha have been planted with crops (Fodder Beet) used for wintering autumn feeding and transition
- Supplements are in the form of grass silage, PKE and fodder beet.
- The season 2017/18 season was challenging to manage with early water restrictions from mid-December and higher temperatures than usual during the summer months.

Willsden

- This is a 306 ha platform, milking 1080 peak cows through a 50 bale rotary shed with in-shed feeding system, cup removers.
- The farm is located in the Selwyn district, west of SH1 between Bankside and Te Pirita (free draining stony soils). It is part of a bigger business running 3 other dairy farms and 2 support blocks. All supplements and grazing of young stock and wintering done on these support blocks is charged back to the farm at market rates.
- 2017-18 was a difficult season, we did not achieve our production budget which has increased our COP/Kg ms compared to previous years.
- Irrigation is done by pivots and rotorainers and water is source from CPW water scheme. In the 2017-18 season, more stored water was used increasing the irrigation cost by $246/ha.
- Supplements are imported in the form of barley (source from outside the business) and silage (source from support blocks) This season additional supplement was fed at an additional cost of $385/ha.
- Annual repasturing on 15% of the farm yearly.
- Administration costs include a proportion of all the business overheads associated with the Camden group, including the Ops Manager and General Manager costs.

Canlac

- This is a privately owned equity partnership that has grown to a total 510 effective hectare platform during this season by converting the neighbouring farm. For the purpose of this exercise, only a 318 ha platform is being taken into account for the 17-18 season.
- The new dairy farm next door was converted through the 17/18 season and was milked on for two months – 15/3/18 to 15/5/18. The milk production and income from this has been excluded.
- There is a 155 hectare runoff supporting this farm that is run as a separate business that charges commercial rates for feed sold, heifer grazing and winter grazing.
- Heifers are grazed from weaning to 21 months off farm on owned heifer grazing property. (Manapouri)
- Close to the Dunsandel township, the farm milked 1367 peak cows with a feed pad (which keep depreciation costs high)
- Irrigated by 2 main pivots 1 rotorainer and some sprinklers in the corners. Water sourced from CPW scheme and bore if necessary.
- Supplements used in this farm are: maize silage (spring/autumn), some grass silage, PKE and fodder beet (in autumn).
- The farm focuses on optimizing grass harvested and feed supplements on the feed pad only to minimize wastage.
- Stock sales is a major strategy for this business, with the use of beef crosses to ensure high stock sale income.
- With the equity partnership growing in total hectares, costs and income (both from milk and stock) have had to be re-calculated to provide as fair a representation as possible to what actually happened on the individual platform used for this exercise.

- The cost of the calf rearer is included in the “calf feed” cost.
- Depreciation, even though it has been dropped from last year, it remains high due to the infrastructure of the farm.

Terrace Holdings Ltd

Terrace Holdings Ltd is a 278 effective hectares’ platform, milking 1,100 cows through a 54 bale rotary shed, part of the Dairy Holdings Ltd. farming group
Mostly irrigated by pivots, this farm runs a system 2 with a herd owning sharemilkers. For the purpose of this exercise, both the farm owner (DHL) and the sharemilkers (O’Connor Dairies) expenses have been combined. Key focus for this farm system is managing pastures with little to no reliance on imported supplements.

Key aspects of pasture management:

- 2400 kgDM/ha at plan start of calving and use of Spring Rotation Planner
- Weekly farm walk
- N use: 240 kgN/ha maximum with one last application of 80 kg urea/ha no later than end April and the use of Sustain during hot period.
- Demand management tools:
    - Early culling
    - Dry-off based on BCS rules
- Maintenance fertilizer is always applied no matter the pay out and capital application done as required to keep soil fertility up.

Supplement decisions:

- Season dependant to a certain point, as most of the silage fed to milkers is harvested from the platform (so technically it is not imported supplement and is included in the pasture and crop eaten KPI)
- There could be strategic use for BCS purposes

Paddock Wood

This is a 160 ha farm located in the Hinds catchment, near the Rangitata River

- Fully irrigated starting its 5th season milking
- Mainly grass based with grain and molasses fed through the shed
- It winters and rears young stock in a neighbouring farm
- Stock trading is part of the strategy of this business to increase income

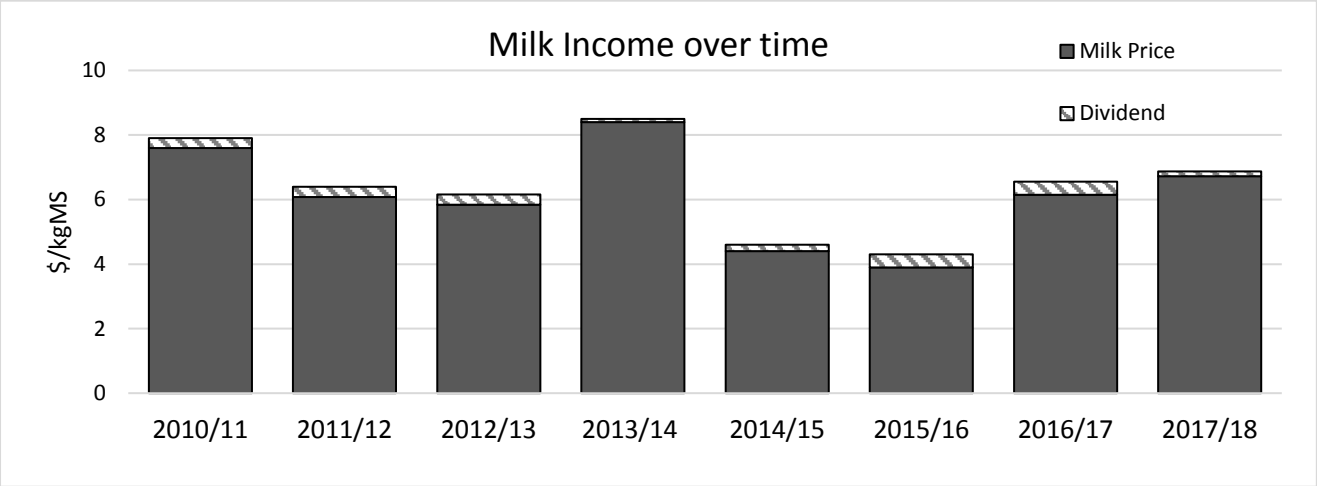
Align Emilius

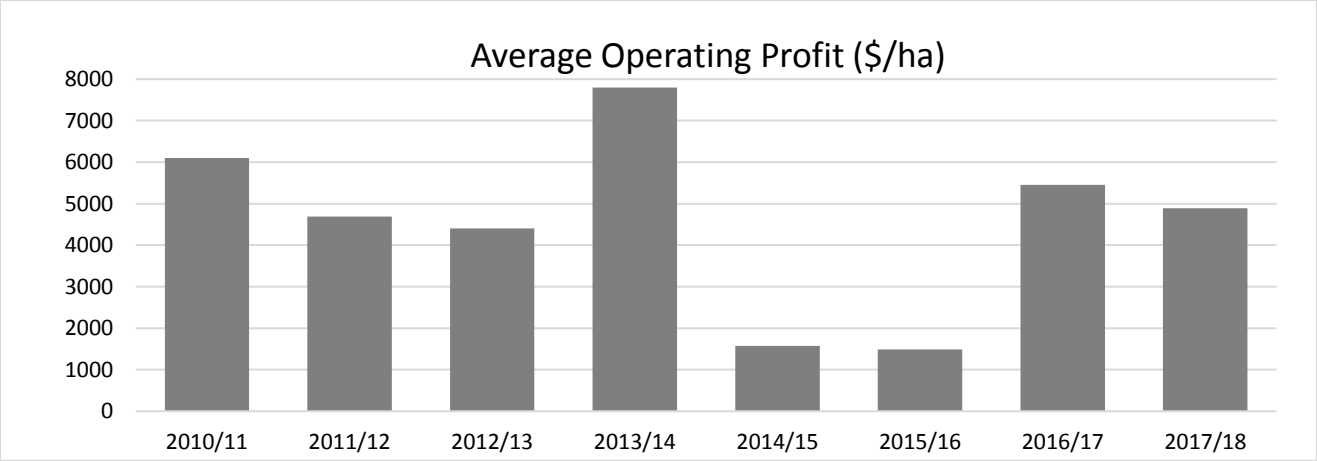
The farm is a 173 effective ha platform which is peak milking 680 cows this season, supplying A2 milk. They grow 7 ha of fodder beet on the platform for supplement. It is predominantly pivot irrigated with 10ha under K lines. This season they have moved start of mating to 14th of October and end to 20th of December.

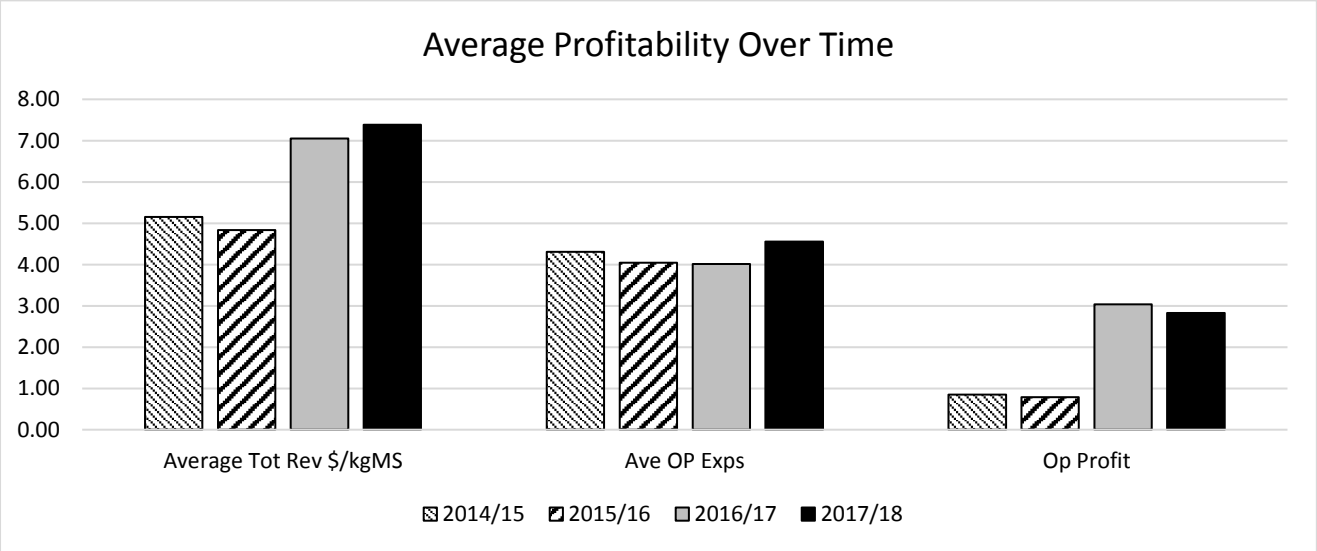
Management Practises

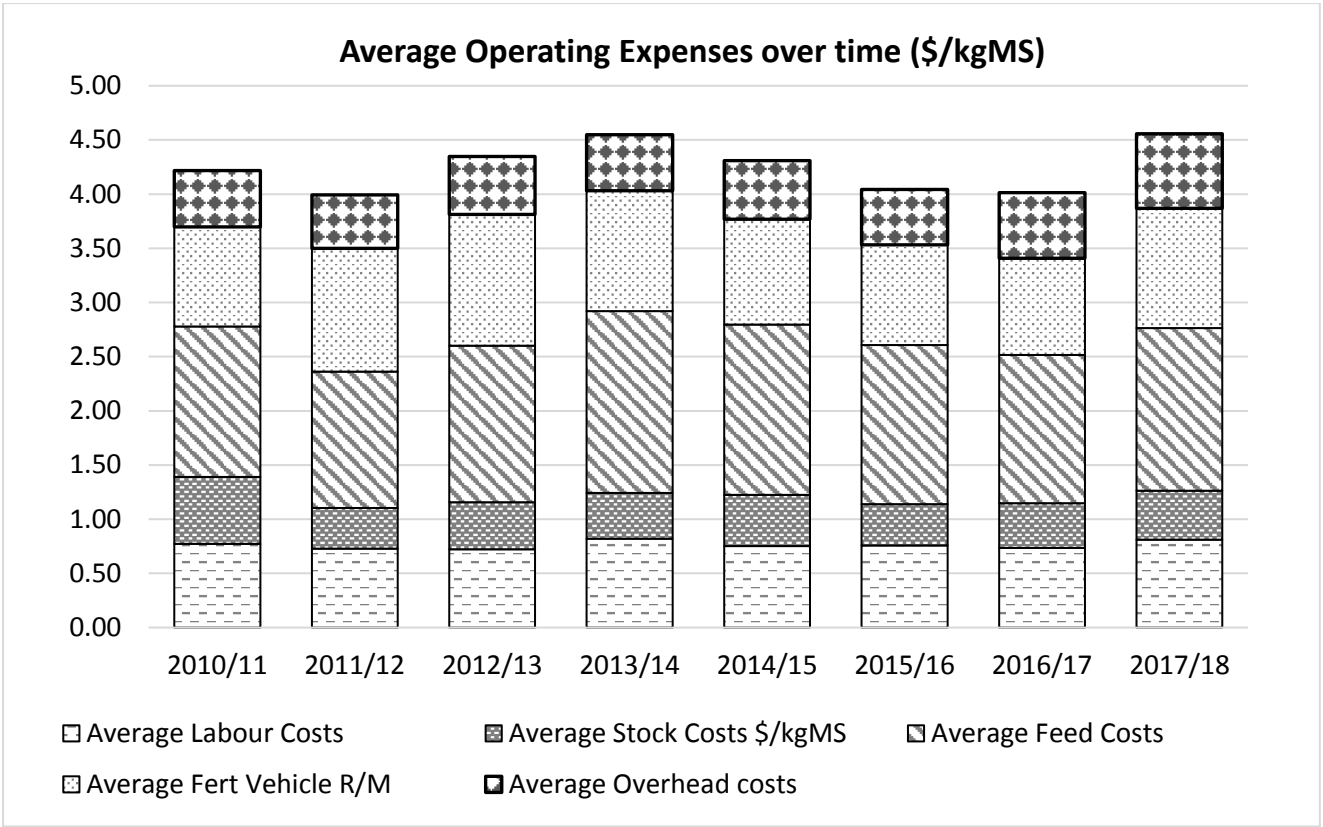
- Aim to dry off at an APC of 2,200 kgDM/ha, having 2,400 – 2,500 kgDM/ha APC at PSC. Lock up a paddock back in March to use for Springers and then Fodder Beet. Use a spring rotation planner through to a balance date around 20th of September. Pasture walks are done twice a week until Christmas, then weekly. They put plantain in mix and this season are only regrassing fodder beet area.
- Autumn feed fodder beet on the platform and then winter on beet at the support block
- Herd testing done and now going to cull on SCC levels. They teat seal all stock
- Carried out two PG why wait programmes. Do 4 weeks and 3 days of AB with A2 semen starting on the 14th of October. All non-cyclers go with Hereford bull from beginning but are still AB'd. Bulls then go out and are pulled out on the 20th of December.
- They have carried out grid soil sampling this season to tailor application of fertiliser as actually required
- Individual BCS is carried out four times a season. Dried off based on condition score and calving date
- Effluent is put through a two pond system and then goes out via direct injection on main pivot and underslung under other two. Effluent area is 85% of the platform.

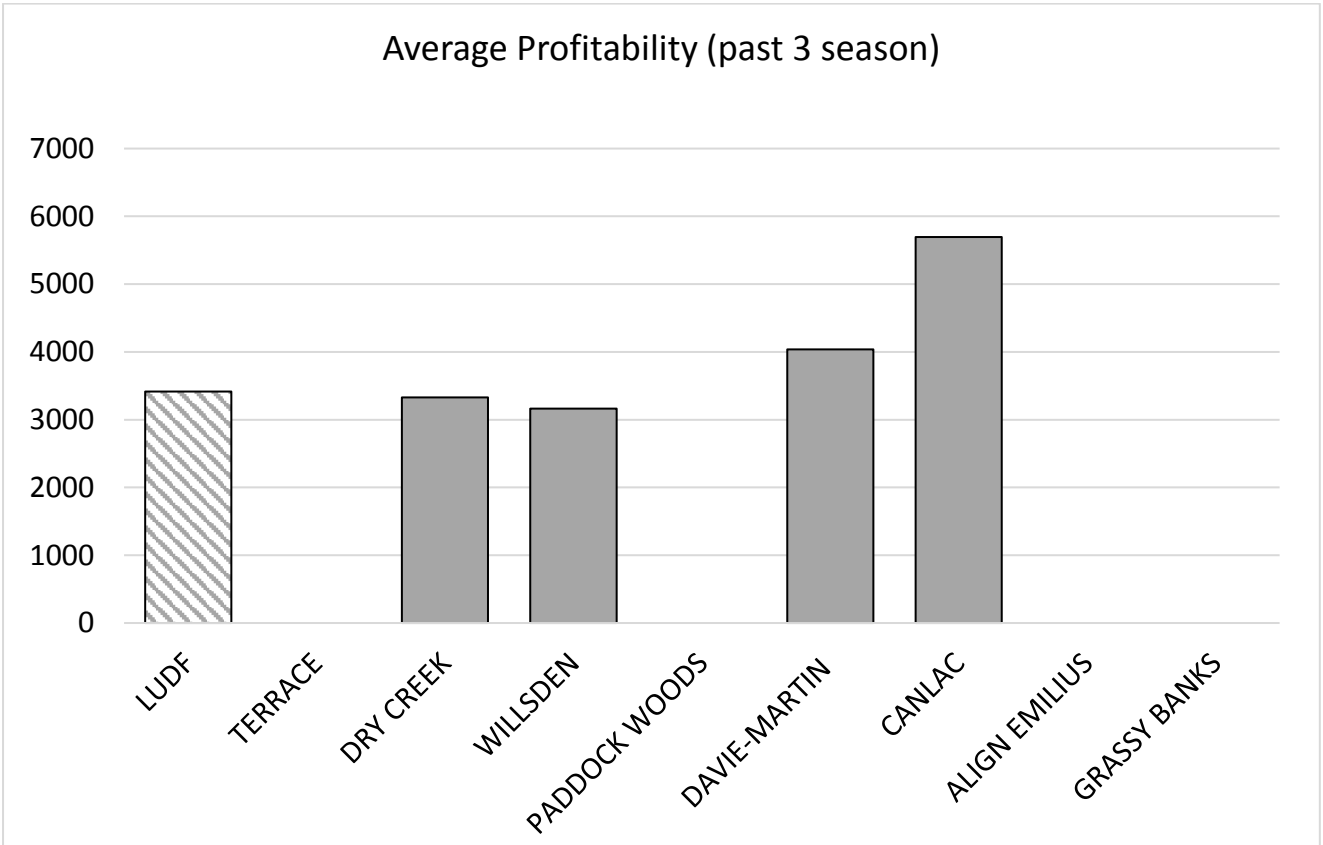
OVERALL PROFITABILITY - CHANGES OVER TIME:

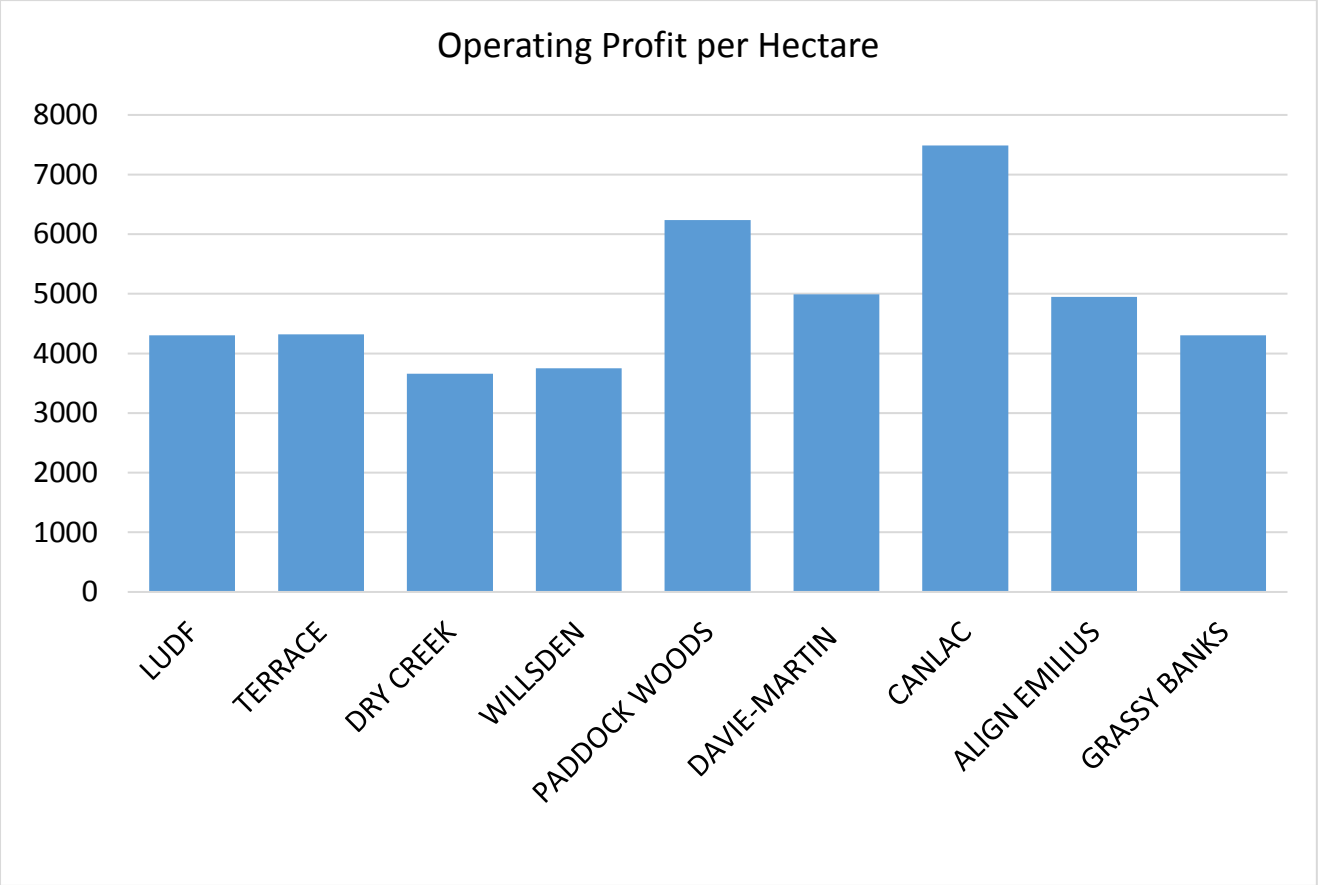


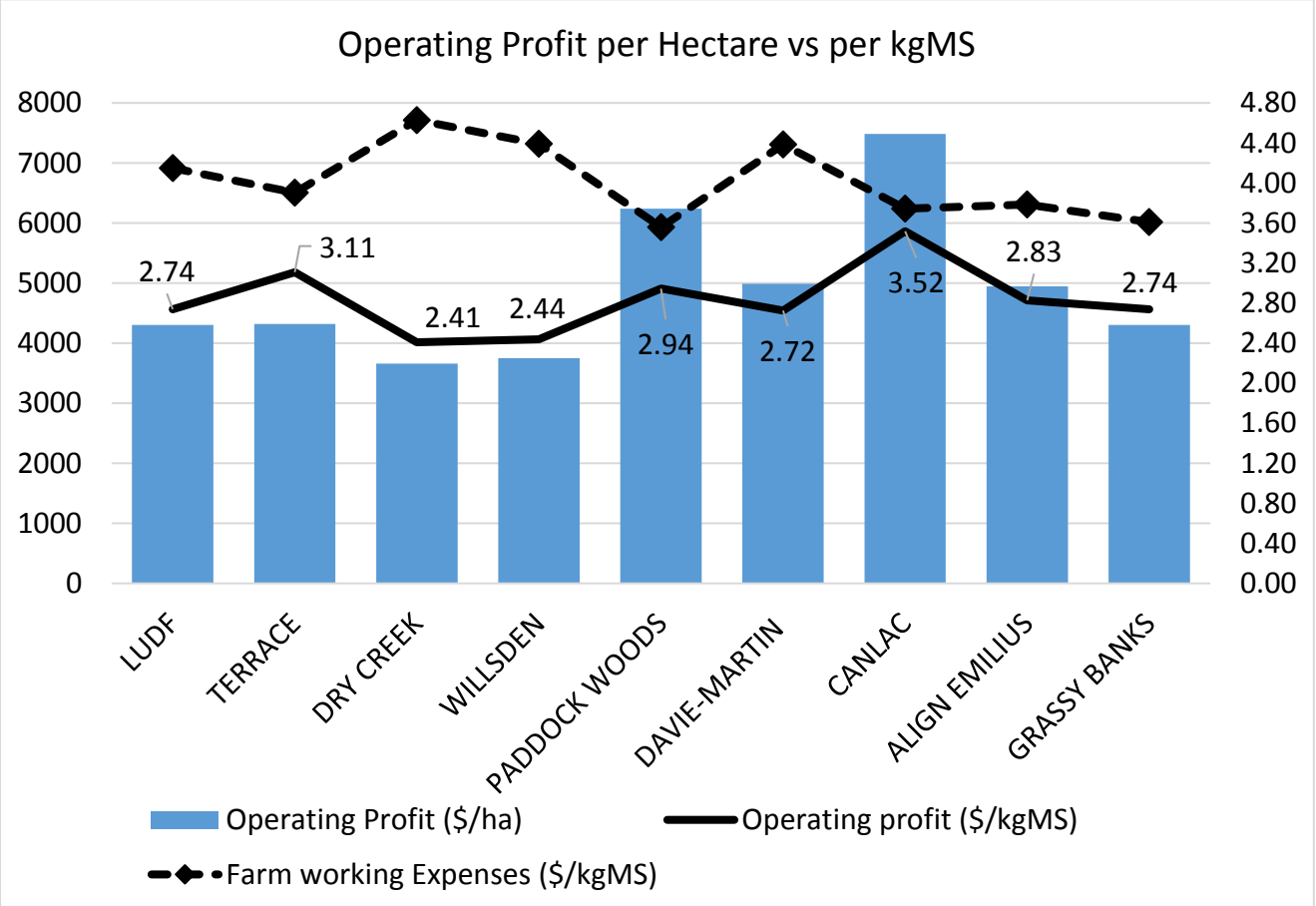


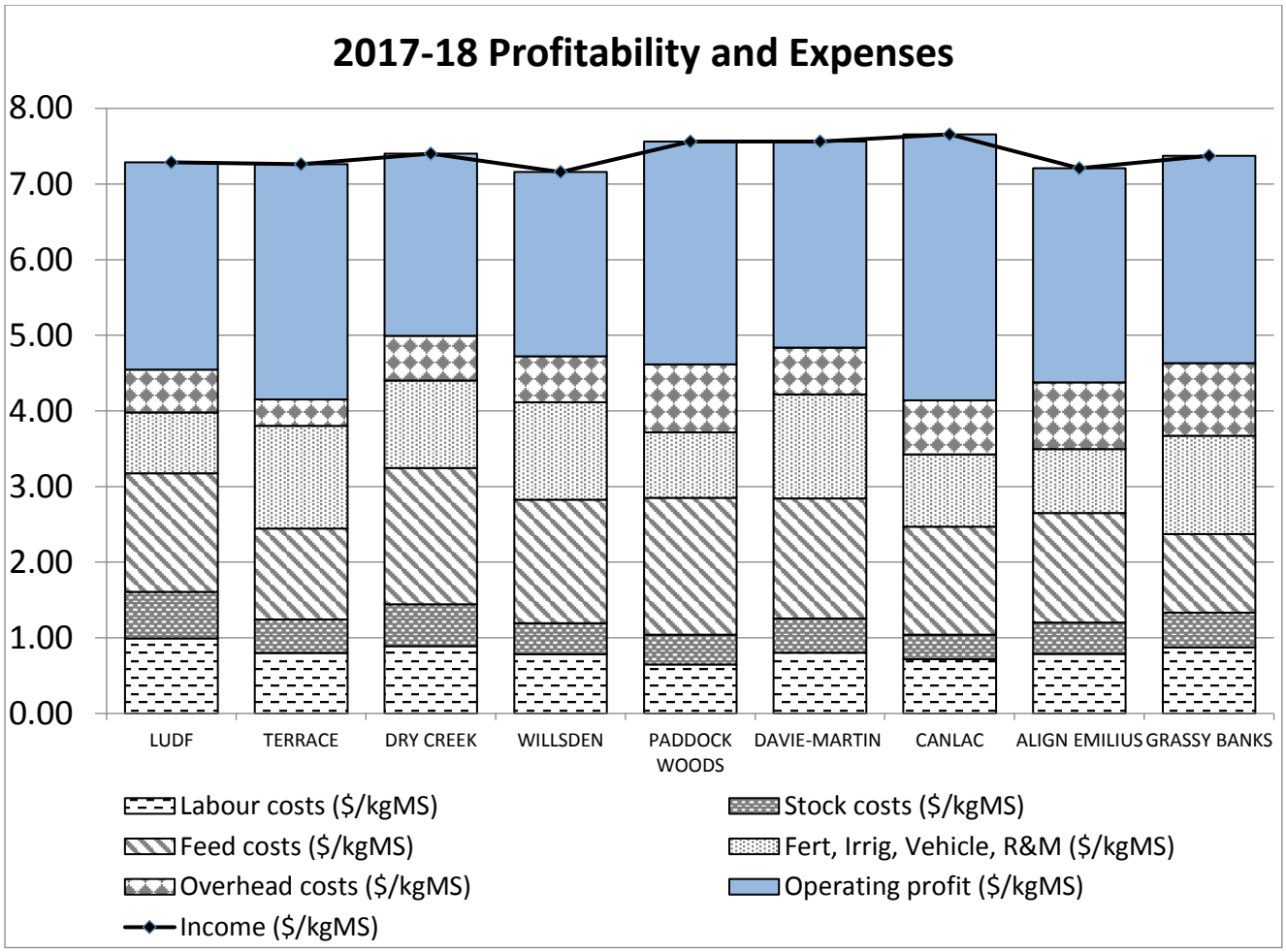



Average Operating Expenses over time ($/kgMS)
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18
Average Labour Costs
Average Stock Costs $/kgMS
Average Feed Costs
Average Fert Vehicle R/M
Average Overhead costs

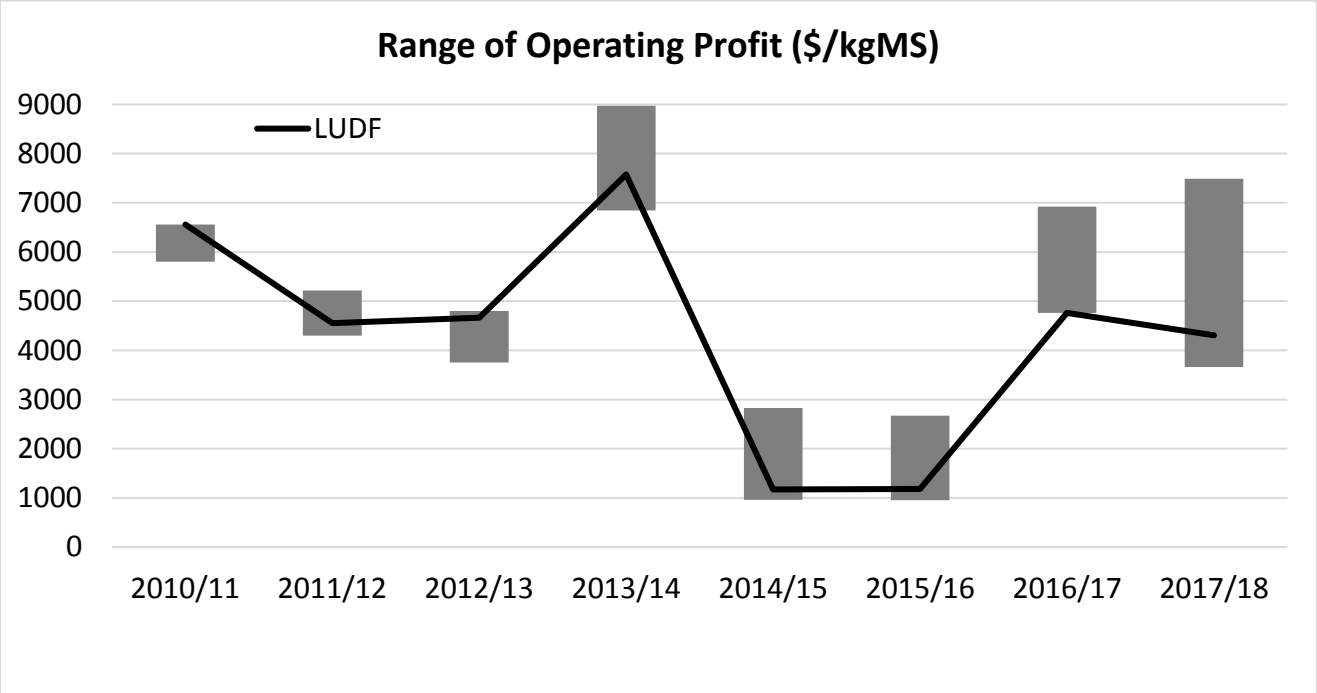

Average Profitability (past 3 season)
7000
6000
5000
4000
3000
2000
1000
0
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS

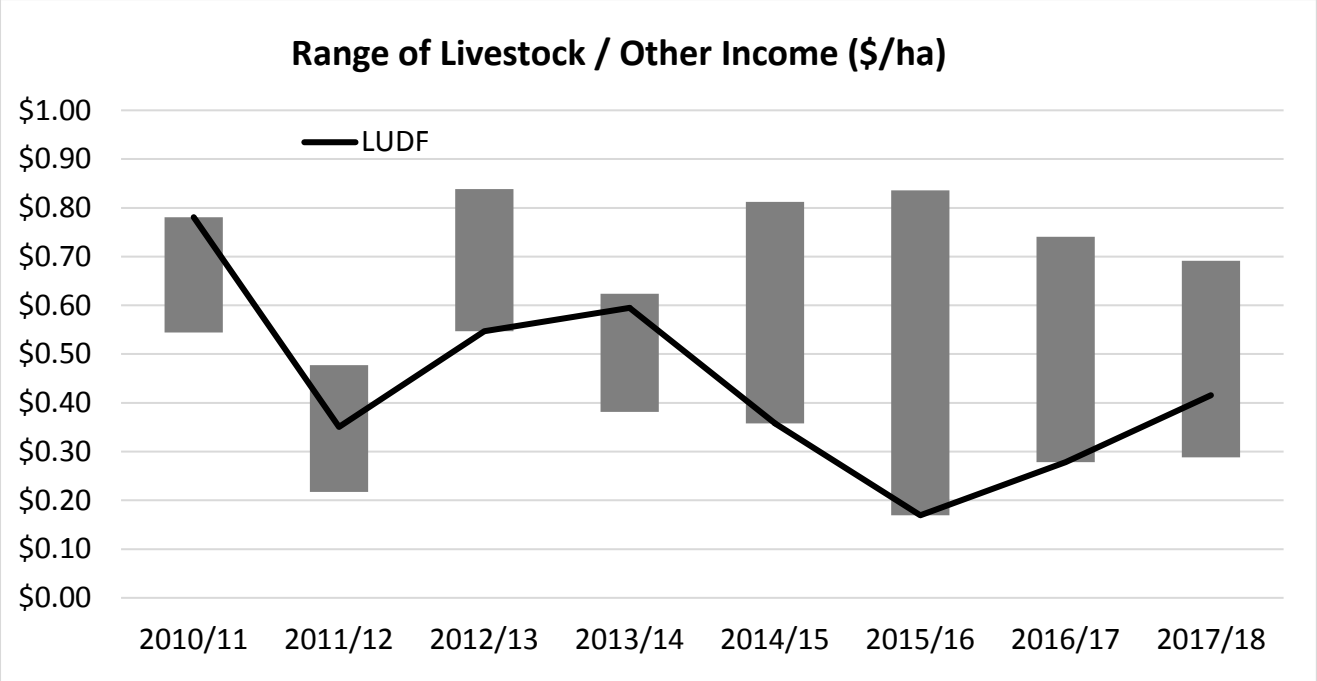

Operating Profit per Hectare
8000
7000
6000
5000
4000
3000
2000
1000
0
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS

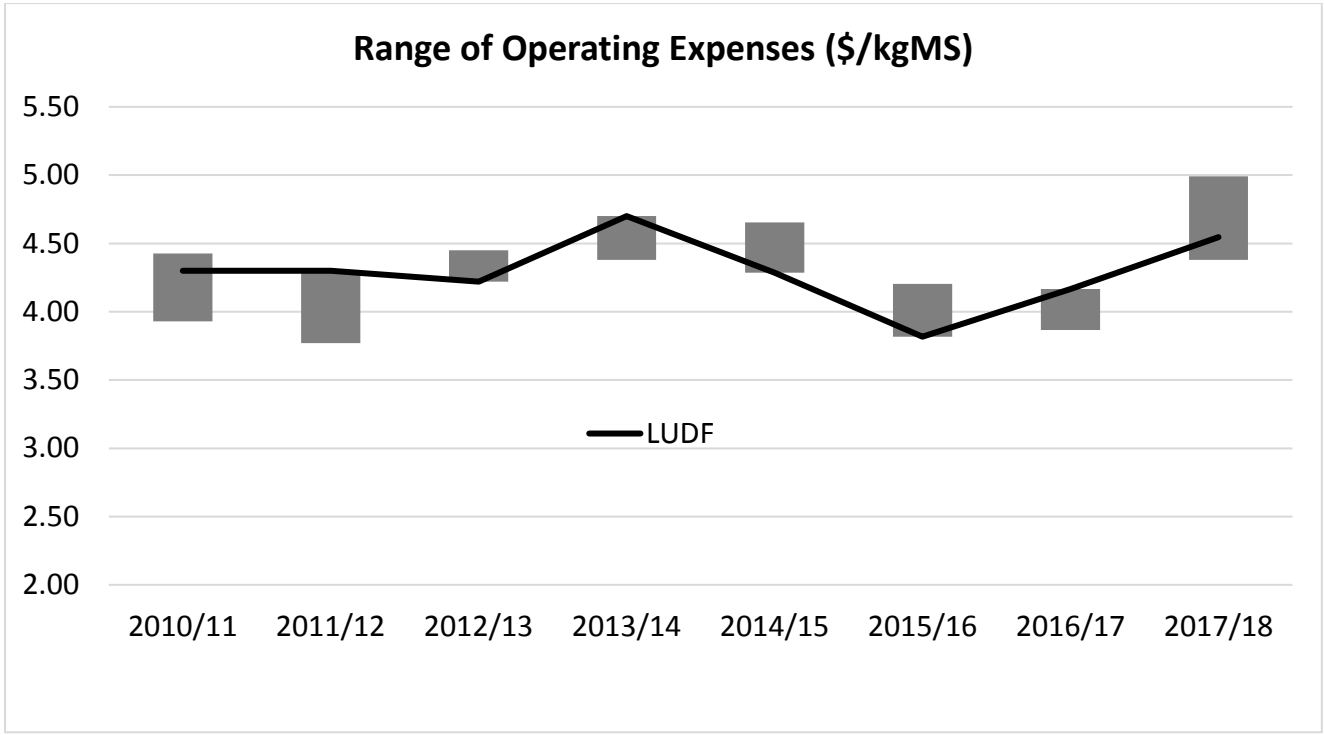

Operating Profit per Hectare vs per kgMS
8000
7000
6000
5000
4000
3000
2000
1000
0
4.80
4.40
4.00
3.60
3.20
2.80
2.40
2.00
1.60
1.20
0.80
0.40
0.00
2.74
3.11
2.41
2.44
2.94
2.72
3.52
2.83
2.74
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS
Operating Profit ($/ha)
Operating profit ($/kgMS)
Farm working Expenses ($/kgMS)

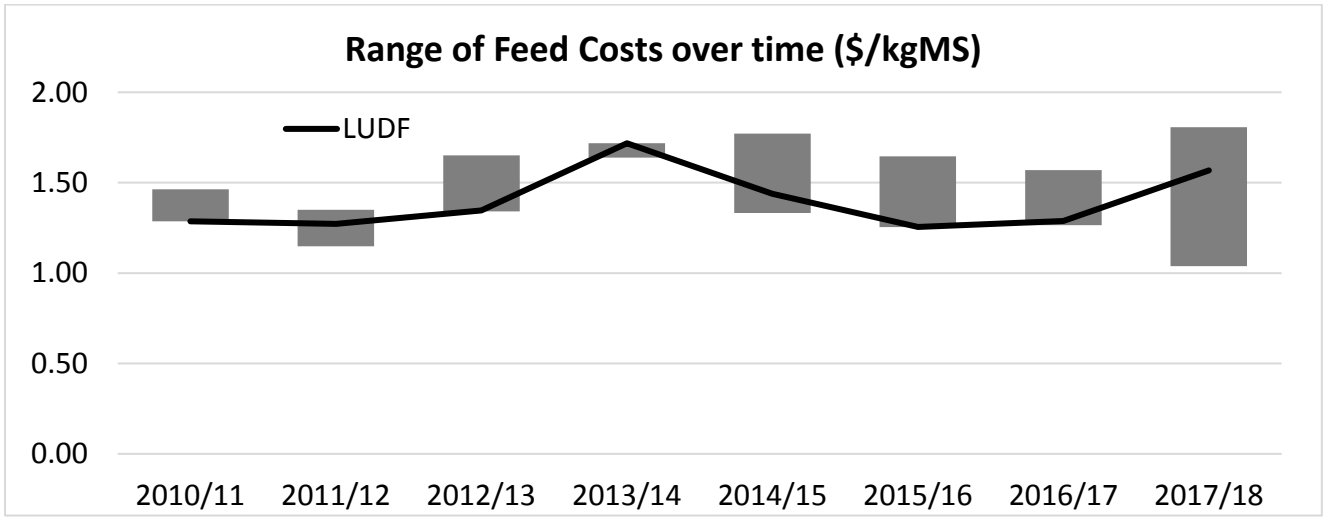

2017-18 Profitability and Expenses
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS
Labour costs ($/kgMS)
Stock costs ($/kgMS)
Feed costs ($/kgMS)
Fert, Irrig, Vehicle, R&M ($/kgMS)
Overhead costs ($/kgMS)
Operating profit ($/kgMS)
Income ($/kgMS)

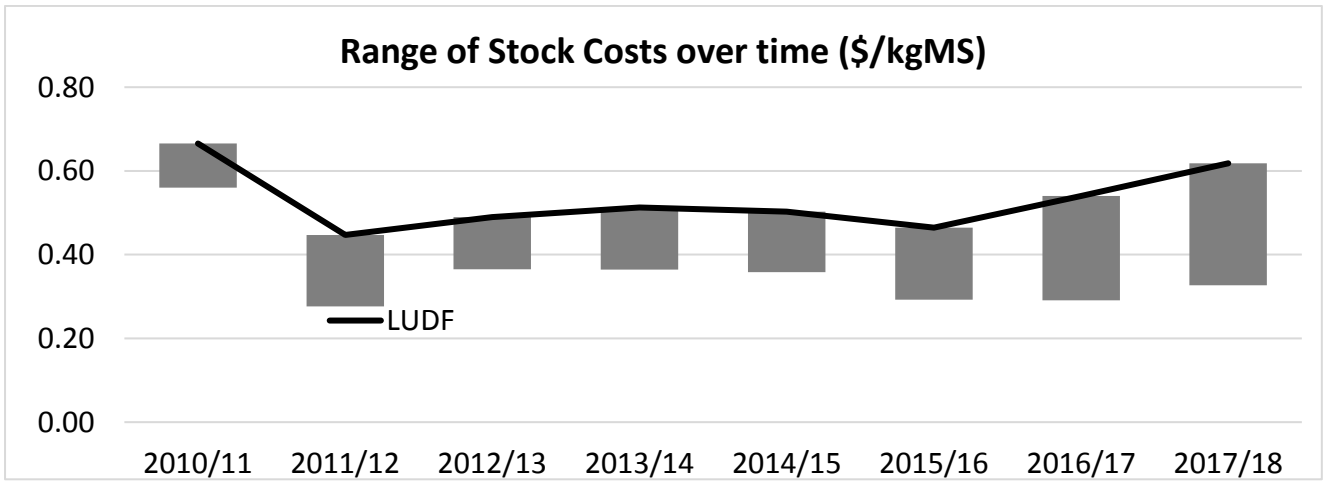
COMPARISONS BETWEEN LUDF AND THE RANGE OF FARMS INCLUDED EACH YEAR:

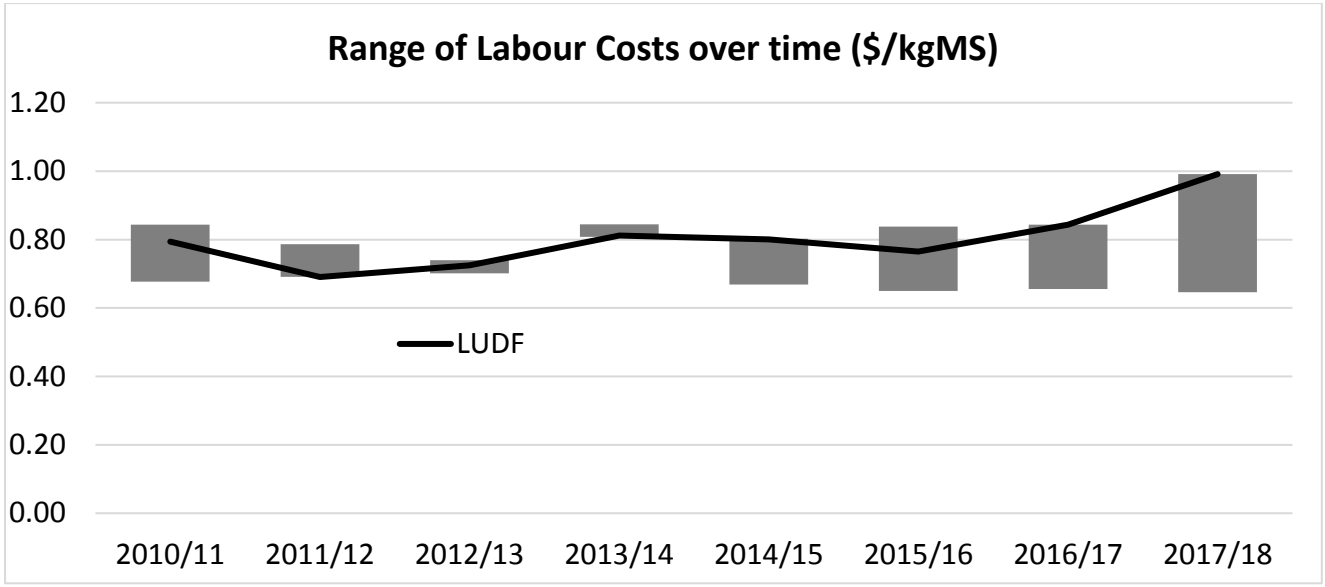


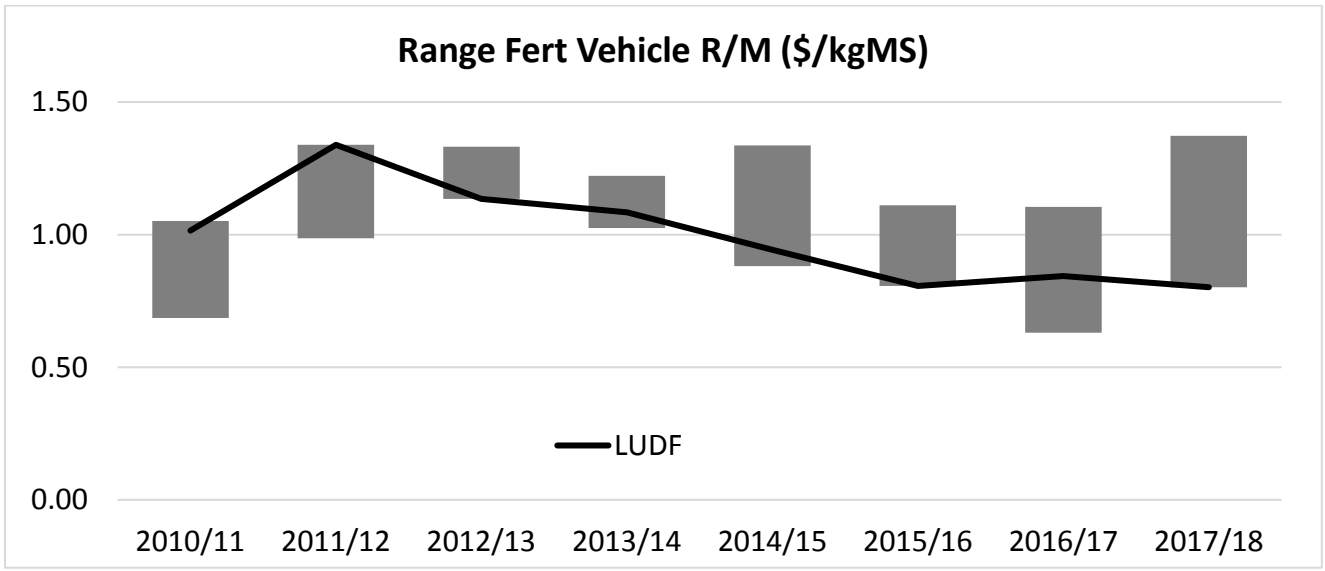


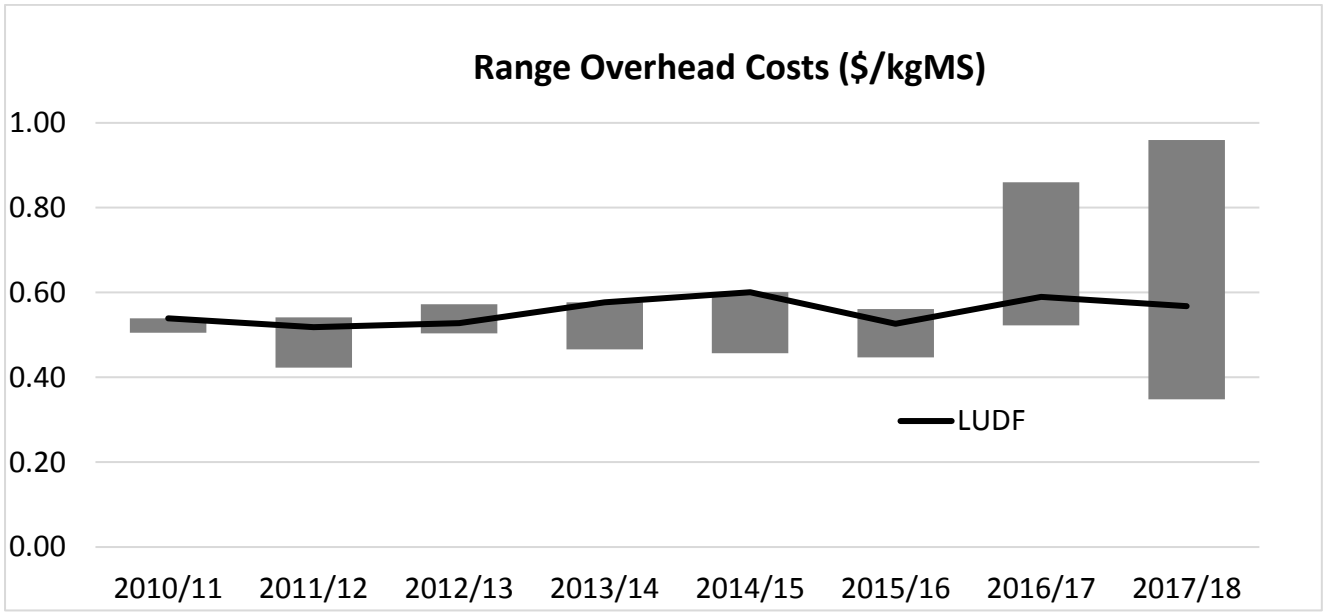

Range of Operating Expenses ($/kgMS)
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
LUDF
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18

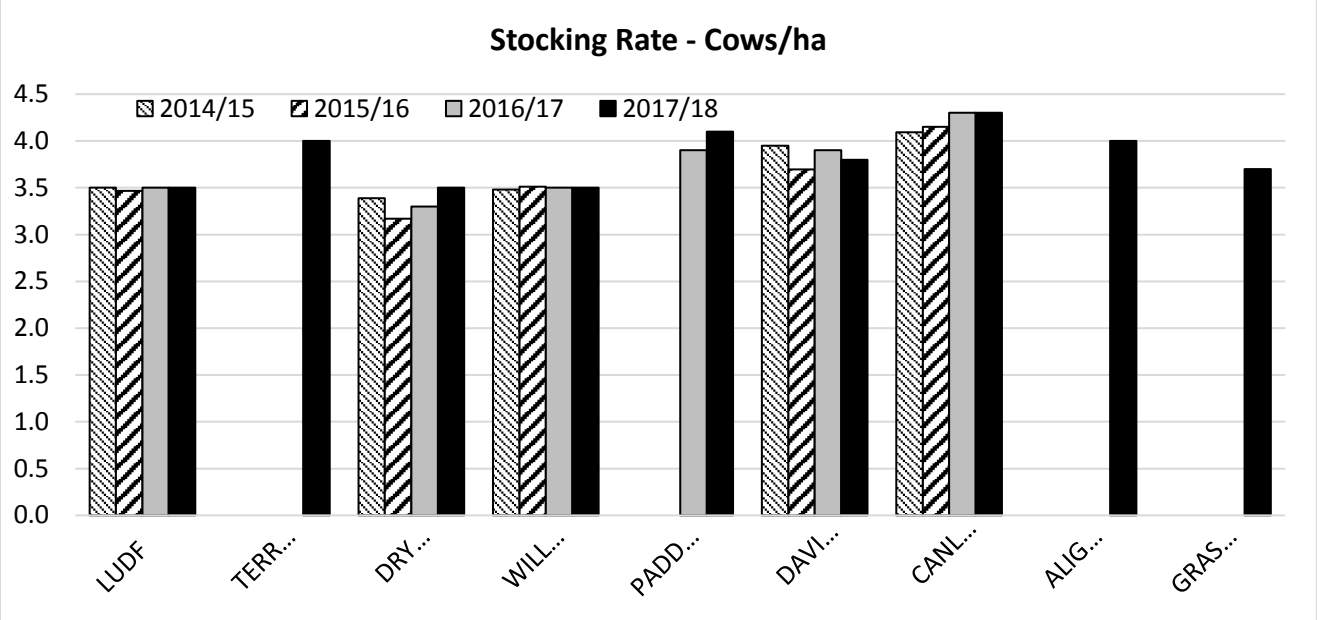

Range of Feed Costs over time ($/kgMS)
2.00
1.50
1.00
0.50
0.00
LUDF
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18

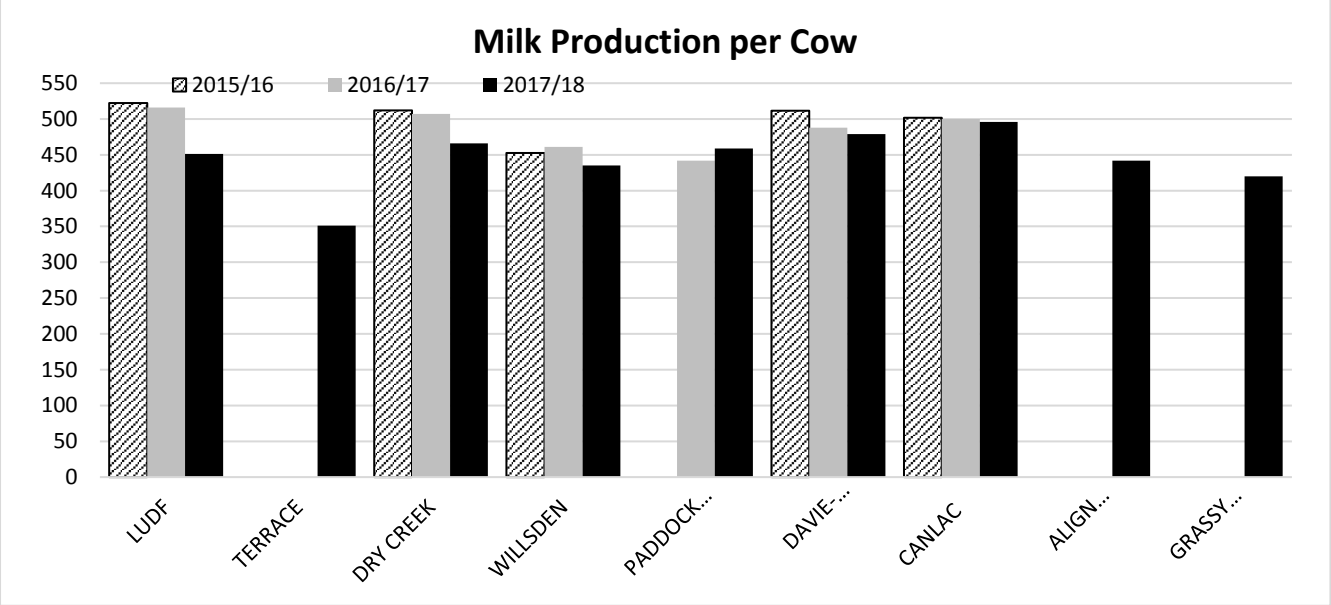

Range of Stock Costs over time ($/kgMS)
0.80
0.60
0.40
0.20
0.00
LUDF
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18

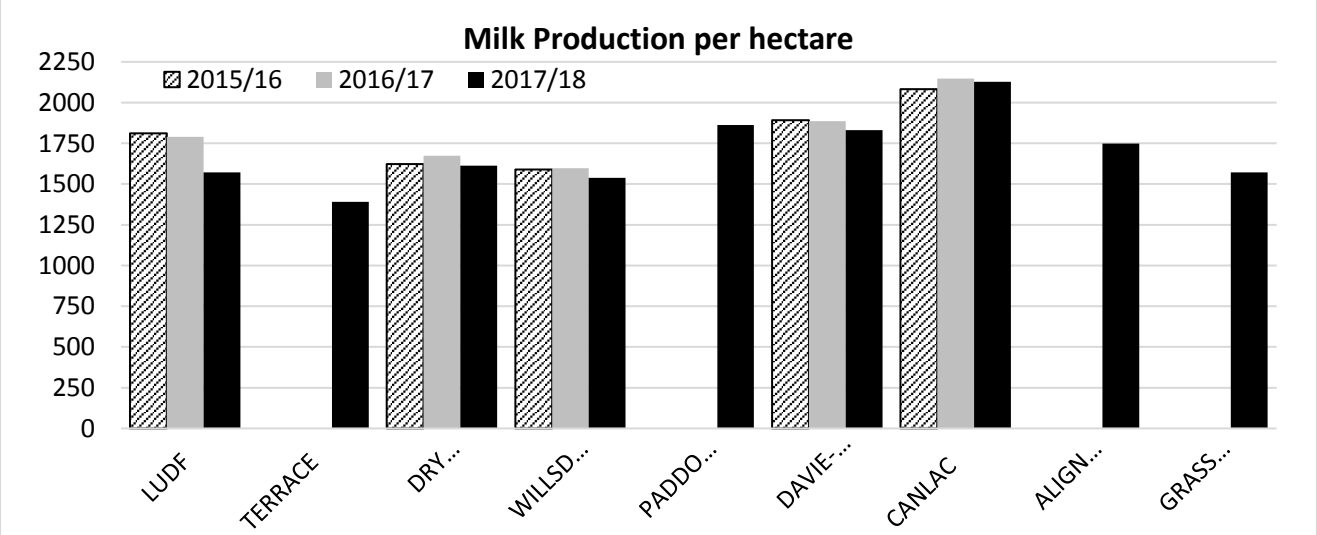

Range of Labour Costs over time ($/kgMS)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
LUDF
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18

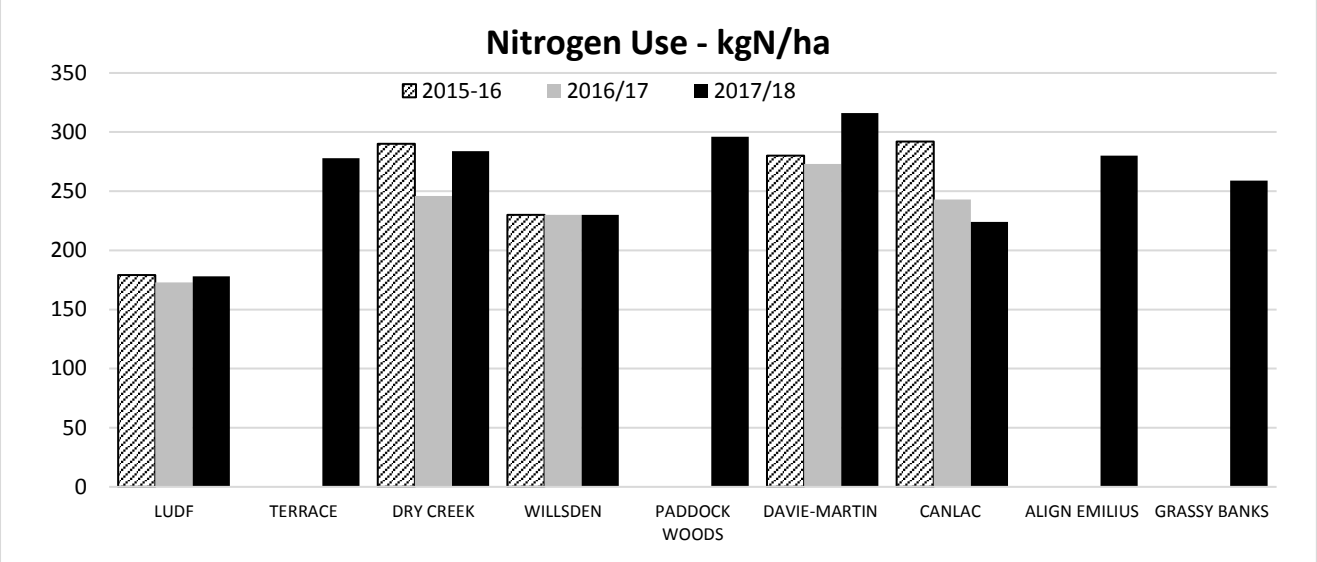

Range Fert Vehicle R/M ($/kgMS)
1.50
1.00
0.50
0.00
LUDF
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18

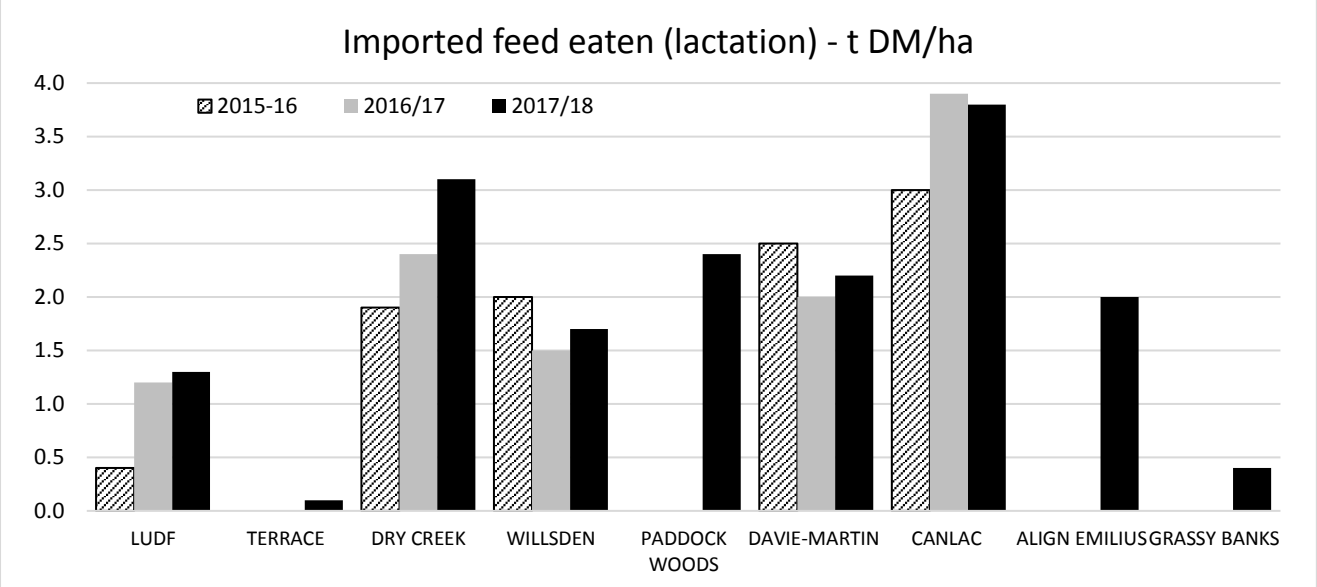

Range Overhead Costs ($/kgMS)
1.00
0.80
0.60
0.40
0.20
0.00
LUDF
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2016/17
2017/18

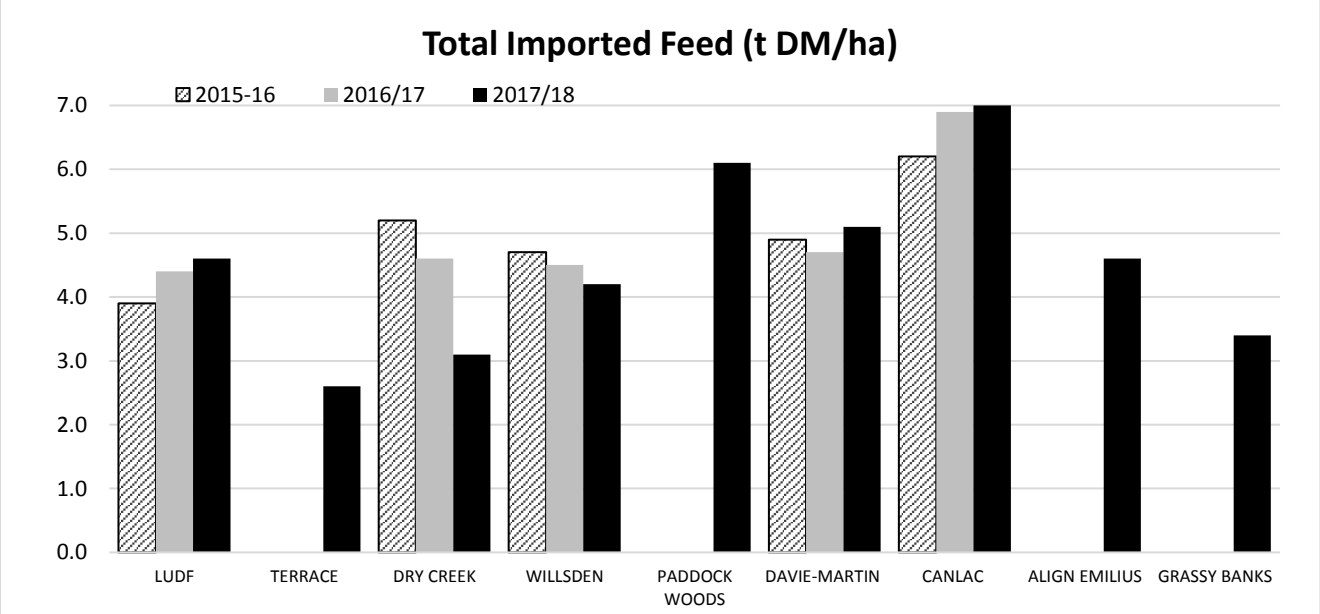


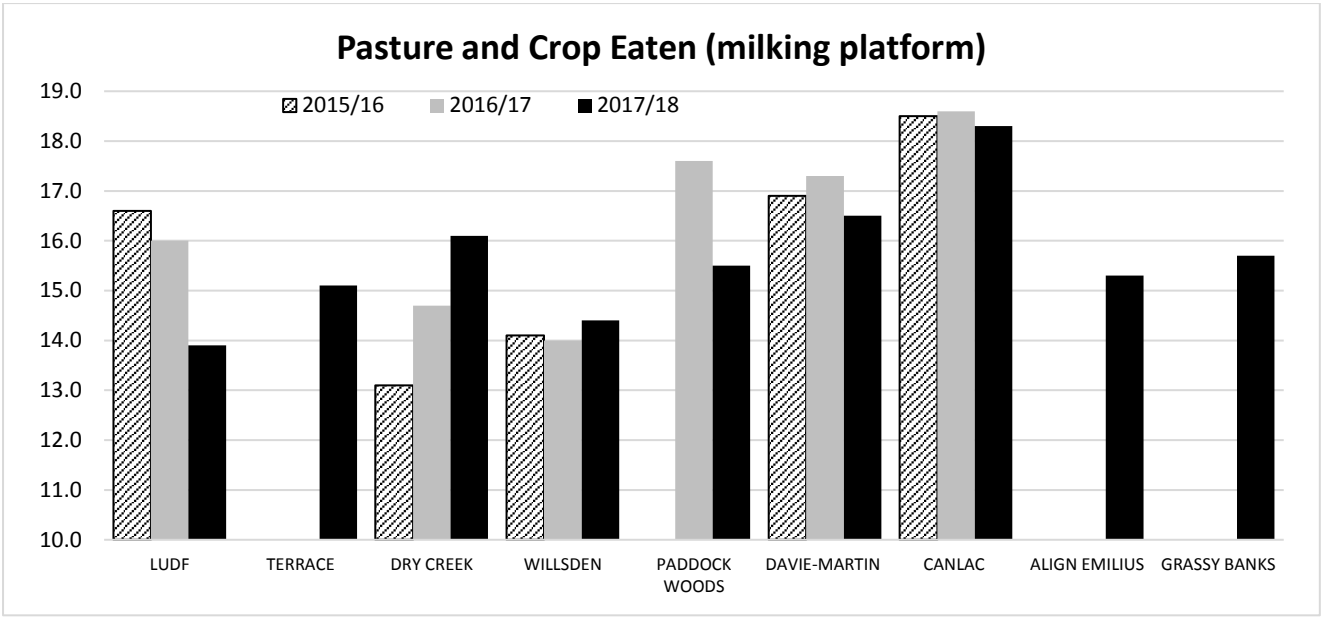


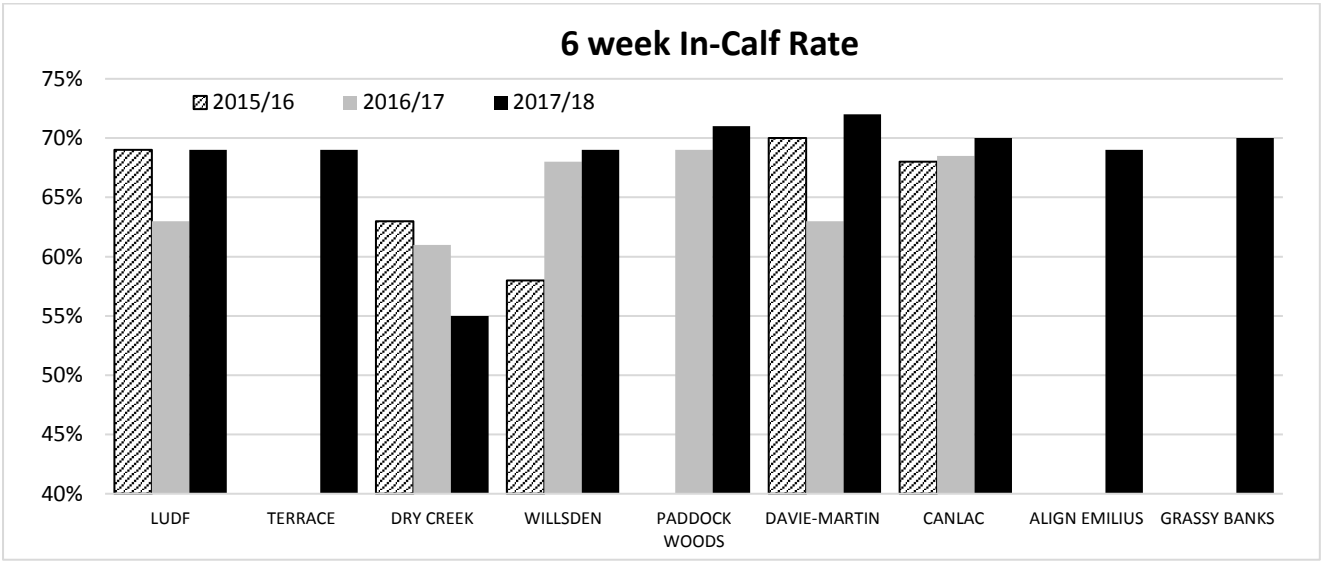


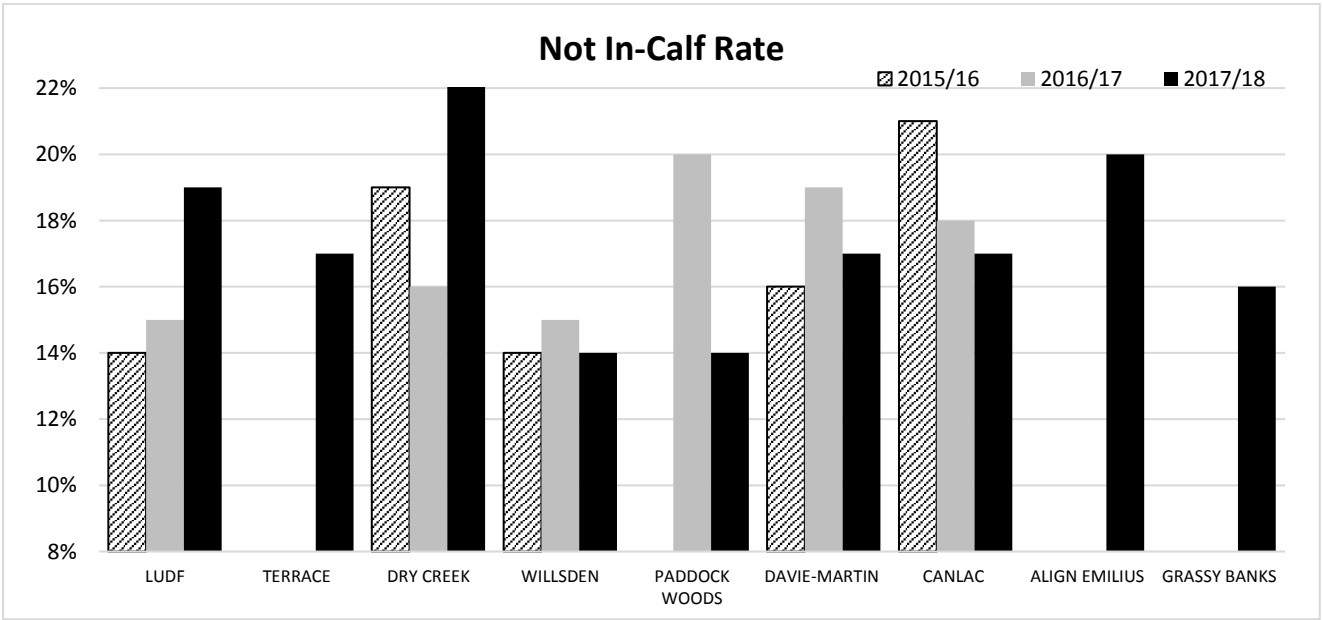

Nitrogen Use - kgN/ha
2015-16
2016/17
2017/18
350
300
250
200
150
100
50
0
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS


Imported feed eaten (lactation) - t DM/ha
2015-16
2016/17
2017/18
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS


Total Imported Feed (t DM/ha)
2015-16
2016/17
2017/18
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS


Pasture and Crop Eaten (milking platform)
2015/16
2016/17
2017/18
19.0
18.0
17.0
16.0
15.0
14.0
13.0
12.0
11.0
10.0
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS


6 week In-Calf Rate
2015/16
2016/17
2017/18
75%
70%
65%
60%
55%
50%
45%
40%
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS


Not In-Calf Rate
2015/16
2016/17
2017/18
22%
20%
18%
16%
14%
12%
10%
8%
LUDF
TERRACE
DRY CREEK
WILLSDEN
PADDOCK WOODS
DAVIE-MARTIN
CANLAC
ALIGN EMILIUS
GRASSY BANKS

SUMMARY OF PHYSICAL PERFORMANCE OF EACH FARM

Season 2017 2018	Davie Martin	Dry Creek	LUDF	Wills-den	Canlac	Terrace Holdings	Paddock Woods	Align Emilius	Grassy Banks
District	Hurunui	Hurunui	Selwyn	Selwyn	Selwyn	Selwyn	Ashbur-ton	Ashbur-ton	Timaru
Effective ha (ha)	141	153.5	160	306		278	160	173	163
Support Block (ha)	90	0		0		0	0	0	90
Support Block	Leased	0		0		0	0	0	Owned + leased
Rainfall (mm)	n/a	n/a	751	n/a	n/a	n/a	n/a	n/a	n/a
Irrigation water source	Hurunui river	Hurunui River	well	CPW	CPW + bore	Wells	Well		
Water Applied (mm)			377	455		460		389	154
Cow Shed	H 40	H44	R50	R50	R50	R54	R54	R60	H36
FTE Paid Labour	2.9	3.6	3.7	6.2	8.0	4.6	2.0	4	3.8
Cows/FTE	163	148	151	175	171	220	210	196	156
Kg MS/FTE	78,232	68,792	63,952	75,918	84,748	77,269	96,159	86,457	65,640
Peak Cow Nos.	539	531	558	1,083	1,367	1,100	650	685	610
Cows /ha	3.8	3.5	3.5	3.5	4.3	4.0	4.1	4	3.7
Kg LW /cow	500	470	480	480	507	430	480	430	450
Kg LW/ha	1911	1626	1674	1699	2175	1701	1950	1703	1,684
BW/reliability (LIC)	88/61	73/46	130/47	96 / 44	108 / 44	78 / 39	88 / 45	90 / 41	118 / 46
PW/ reliability (LIC)	122/72	93/68	131/67	119 / 54	145 / 51	96 / 41	132 / 66	114 / 47	155 / 66
Replac. Calves reared	168	117	140	235	391	280	142	175	199
KG MS/Cow	479	466	451	435	496	351	459	442	420
Kg MS /ha	1,831	1,613	1571	1538	2128	1390	1,863	1,749	1,571
% MS	9.1%	8.9%	9.2%	8.8%	9.2%	8.50%	8.90%	8.90%	9.50%
% Fat	5.3%	5.1%	5.1%	4.9%	5.3%	4.80%	5.00%	5.00%	5.40%
% Protein	3.9%	3.8%	4.1%	3.9%	4.0%	3.80%	3.90%	4.00%	4.10%
Kg MS as % LW	96%	99%	94%	91%	98%	82%	96%	103%	93%
10 days Peak kgMS/cow/day	2.35	2.2	2.16	2.12	2.18	1.8	2.02		1.9
Average kg MS/cow/day	1.9	1.8	1.7	1.6	1.8	1.4	1.7	1.6	1.5
Monthly production drop from peak to 31 Dec	7.3%	7.2%	7.5%	6.4%	5.0%	8.2%	7.30%		5.30%
Days in Milk per cow	255	263	264	265	273	247	271	270	276
% cows milked on 1 Dec as % opening cows	95%	97%	96%	97%	96%	96%	98%		95%
% herd entering as heifers	25%	24%	23%	21%	22%	24%	28%		26%
first calvers on farm at the end of the season	90%	79%	92%	96%	88%	53%	83%		89%

Season 2017 2018	Davie Martin	Dry Creek	LUDF	Wills-den	Canlac	Terrace Holdings	Paddock Woods	Align Emilius	Grassy Banks
Planned Start of Calving	1-Aug	1-Aug	1-Aug	1-Aug	1-Aug	1-Aug	28-Jul	1-Aug	1-Aug
% calved 3 weeks	71%	65%	47%	62%	63%	67%	60%	48%	66%
% calved 6 weeks	88%	85%	72%	84%	84%	85%	83%	79%	86%
% calved 9 weeks	100%	95%	92%	97%	95%	98%	98%	92%	96%
6 weeks in calf (%) (estimated)	72%	55%	69%	69%	70%	69%	71%	69%	70%
Mt Rate (%)	17%	24%	19%	14%	17%	17%	14%	20%	16%
Start of Mating	25-Oct	24-Oct	18-Oct	26-Oct	19-Oct	20-Oct	20-Oct	14-Oct	23-Oct
Weeks of AB	11	5	7	6	5	6	6	4	8
Weeks Mating	11	10	11	11	11	10	10	10	11
3 weeks Sub. rate	83%	80%	82%	86%	87%	81%	85%	80%	86%
% horm. intervention	4%	24%	0%	0%	13%	0%	6%	0	7%
% Cows Treated Lameness	11%	14%	22%	6%	5%		2%	8%	5%
Av SCC for season	185,000	143,000	156,000	171,000	125,000	125,000	109,000	124,000	130,000
Pasture & Crop Eaten T DM /ha	16.5	16.1	13.9	14.4	18.3	15.1	15.5	15.3	15.7
Supplem imported T DM eaten /ha	2.2	3.1	1.3	1.7	3.8	0.1	2.4	2.0	0.4
Grazing off TDM eaten /ha	2.9		3.3	2.5	3.2	2.5	3.7	2.6	3
Total Feed Eaten TDM/Ha	21.7	19	18.5	18.6	24.9	17.7	21.7	20.2	19
kg supplem imported Kg DM eaten/cow	574	890	378	470	878	37	593	515	110
Kg Supplement + Grazing off Kg DM eaten/cow	1340	890	1322	1177	1620	667	1513	1173	912
Average % Utilization imported supplement	88%	83%	85%	73%	86%	90%	88%	90%	88%
MJME/kg DM imp supp.	10.9	10.7	11.5	10.8	10.6	10.5	12	12	10.3
kg N/ha	316	284	178	230	224	278	296	280	259
Main Supplement Type	PKE/ Silage	PKE/ Silage/ crop	Silage	silage/ barley	Maize silage/ Silage /PKE	silage	Silage/ barley/ PKE	Silage / Barley/ FB/ Straw	
Area harvested for silage (%)	0%	13%	22%	0%	23%	13%	0		25%
Winter Crop of MP (Ha)	0	11.3	0	14	12.4	0	12		4.7
Summer Crop on MP (Ha)	0	0	0	0	0	0	0		0

OPERATING PROFIT PER HECTARE:

Season 2017 2018	Davie Martin	Dry Creek	LUDF	Willsden	Canlac	Terrace Holdings	Paddock Woods	Align Emilius	Grassy Banks
Milk Income (MS x $6.75)	12,359	10,255	10,607	10,383	14,364	9,381	12,576	11,807	10,601
Dividend Income (MS x $0.15)	275	228	236	231	319	208	279	262	236
DairyNZ Levy (MS x $0.036)	66	55	-57	-55	-77	-50	-67	-63	-57
Stock Sales	1,003	1,412	788	652	1,171	612	1,368	997	820
Stock Purchased	-60	-425	206	0	0	437	172	304	130
Stock Adjustment	267	-365	81	-222	518	369	22	-139	108
Net Stock Income	1,210	622	663	430	1,689	544	1,218	554	797
Other Income	67	193	0	23	0	7	81	46	0
TOTAL INCOME	**13,844**	**11,244**	**11,449**	**11,011**	**16,295**	**10,090**	**14,087**	**12,606**	**11,577**
OPERATING EXPENSES									
Wages	1,311	1,352	1,558	1,208	1,524	1,004	673	1,377	895
Labour Adjustment Unpaid	54	0	0	0	0	29	25	0	0
Labour Adjustment Management	104	0	0	0	0	79	506	0	480
Total Labour Costs	**1,470**	**1,352**	**1,558**	**1,208**	**1,524**	**1,112**	**1,204**	**1,377**	**1,375**
Animal Health	487	294	411	228	259	212	329	298	362
Breeding and Herd Improvement	124	298	327	217	241	166	156	220	225
Farm Dairy	39	73	57	83	36	105	196	69	2
Electricity (Farm Dairy and Water Supply)	180	177	177	99	161	131	59	137	129
Total Stock Expenses	**830**	**842**	**972**	**627**	**696**	**614**	**740**	**724**	**718**
Net Made / Purchased / Cropped	1,184	1,673	578	929	1,912	131	946	892	864
Feed Inventory Adjustment	43	-6	0	0	-414	21	106	38	-231
Calf Feed	69	119	188	64	138	24	236	29	135
Total Supplement Expenses	1,296	1,786	766	993	1,636	176	1,288	958	768

Season 2017 2018	Davie Martin	Dry Creek	LUDF	Willsden	Canlac	Terrace Holdings	Paddock Woods	Align Emilius	Grassy Banks
Young stock grazing	0	952	765	678	860	837	907	0	0
Winter cow Grazing	324	0	933	839	541	658	1,172	1,578	0
Support Block lease	1,288	0	0	0	0	0	0	0	543
Owned Support Block Adjustment	0	0	0	0	0	0	0	0	441
Total Grazing and Support Block Expenses	1,612	952	1,697	1,517	1,400	1,495	2,078	1,578	974
TOTAL FEED Expenses	**2,908**	**2,738**	**2,464**	**2,511**	**3,036**	**1,671**	**3,366**	**2,536**	**1,742**
Fertilizers	546	336	192	473	206	306	309	721	644
Nitrogen	518	282	259	0	338	398	279	0	0
Irrigation (electricity /rates)	283	275	285	1,098	989	556	291	206	521
Regrassing	45	292	66	131	31	63	4	48	37
Weeds and Pests	5	4	2	9	0	18	18	29	2
Vehicle	501	229	52	30	72	113	69	134	212
Fuel	0	0	58	61	72	74	118	0	120
R&M land and buildings	515	331	138	144	132	161	415	0	401
R&M Plants and equipment	0	0	133	41	193	112	26	269	51
Freight and General (incl farm travel)	99	5	76	0	0	87	88	72	55
Total Other Farm Working Expenses	**2,512**	**1,755**	**1,260**	**1,986**	**2,034**	**1,888**	**1,617**	**1,479**	**2,044**
Administration	272	122	136	287	140	76	123	338	184
Insurance	109	105	59	17	60	90	114	88	123
ACC	61	35	0	25	0	27	33	43	65
Rates	69	78	72	92	64	74	69	73	122
Depreciation	625	558	625	509	1,255	217	1,335	1002	915
Total Overheads	**1,135**	**898**	**892**	**930**	**1,519**	**484**	**1,674**	**1543**	**1,409**
Total Operating Expenses	**8,856**	**7,584**	**7,145**	**7,262**	**8,809**	**5,769**	**8,601**	**7,658**	**7,288**
Operating Profit	**4,989**	**3,660**	**4,304**	**3,749**	**7,486**	**4,321**	**5,486**	**4,948**	**4,289**
Farm Working Expenses Total	**8,029**	**7,033**	**6,520**	**6,753**	**7,968**	**5,424**	**6,630**	**6,619**	**5,683**

OPERATING PROFIT PER KG MS

Season 2017 2018	Davie Martin	Dry Creek	LUDF	Willsden	Canlac	Terrace Holdings	Paddock Woods	Align Emilius	Grassy Banks
Milk Income (MS x $6.75)	6.75	6.75	6.75	6.75	6.75	6.75	6.75	6.75	6.75
Dividend Income (MS x $0.15)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
DairyNZ Levy (MS x $0.036)	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
Stock Sales	0.55	0.93	0.50	0.42	0.55	0.44	0.73	0.57	0.52
Stock Purchased	-0.03	-0.28	0.13	0.00	0.00	0.31	0.09	0.17	0.08
Stock Adjustment	0.15	-0.24	0.05	-0.14	0.24	0.27	0.01	-0.08	0.07
Net Stock Income	0.66	0.41	0.42	0.28	0.79	0.39	0.65	0.32	0.51
Other Income	0.04	0.13	0.00	0.01	0.00	0.01	0.04	0.03	0.00
TOTAL INCOME	**7.56**	**7.40**	**7.29**	**7.16**	**7.66**	**7.26**	**7.56**	**7.21**	**7.37**
OPERATING EXPENSES									
Wages	0.72	0.89	0.99	0.79	0.72	0.72	0.36	0.79	0.57
Labour Adjustment Unpaid	0.03	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00
Labour Adjustment Management	0.06	0.00	0.00	0.00	0.00	0.06	0.27	0.00	0.31
Total Labour Costs	**0.80**	**0.89**	**0.99**	**0.79**	**0.72**	**0.80**	**0.65**	**0.79**	**0.88**
Animal Health	0.27	0.19	0.26	0.15	0.12	0.15	0.18	0.17	0.23
Breeding and Herd Improvement	0.07	0.20	0.21	0.14	0.11	0.12	0.08	0.13	0.14
Farm Dairy	0.02	0.05	0.04	0.05	0.02	0.08	0.11	0.04	0.00
Electricity (Farm Dairy and Water Supply)	0.10	0.12	0.11	0.06	0.08	0.09	0.03	0.08	0.08
Total Stock Expenses	**0.45**	**0.55**	**0.62**	**0.41**	**0.33**	**0.44**	**0.40**	**0.41**	**0.46**
Net Made / Purchased / Cropped	0.65	1.10	0.37	0.60	0.90	0.09	0.51	0.51	0.55
Feed Inventory Adjustment	0.02	-0.00	0.00	0.00	-0.19	0.01	0.06	0.02	-0.15
Calf Feed	0.04	0.08	0.12	0.04	0.06	0.02	0.13	0.02	0.09
Total Supplement Expenses	0.71	1.18	0.49	0.65	0.77	0.13	0.69	0.55	0.49

Season 2017 2018	Davie Martin	Dry Creek	LUDF	Willsden	Canlac	Terrace Holdings	Paddock Woods	Align Emilius	Grassy Banks
Young stock grazing	0.00	0.63	0.49	0.44	0.40	0.60	0.49	0.00	0.00
Winter cow Grazing	0.18	0.00	0.59	0.55	0.25	0.47	0.63	0.90	0.00
Support Block lease	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34
Owned Support Block Adjustment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28
Total Grazing and Support Block Expenses	0.88	0.63	1.08	0.99	0.66	1.08	1.12	0.90	0.62
TOTAL FEED Expenses	**1.59**	**1.80**	**1.57**	**1.63**	**1.43**	**1.20**	**1.81**	**1.45**	**1.11**
Fertilizers	0.30	0.22	0.12	0.31	0.10	0.22	0.17	0.41	0.41
Nitrogen	0.28	0.19	0.16	0.00	0.16	0.29	0.15	0.00	0.00
Irrigation (electricity/rates)	0.15	0.18	0.18	0.71	0.46	0.40	0.16	0.12	0.33
Regrassing	0.02	0.19	0.04	0.09	0.01	0.05	0.00	0.03	0.02
Weeds and Pests	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.02	0.00
Vehicle	0.27	0.15	0.03	0.02	0.03	0.08	0.04	0.08	0.13
Fuel	0.00	0.00	0.04	0.04	0.03	0.05	0.06	0.00	0.08
R&M land and buildings	0.28	0.22	0.09	0.09	0.06	0.12	0.22	0.00	0.26
R&M Plants and equipment	0.00	0.00	0.08	0.03	0.09	0.08	0.01	0.15	0.03
Freight / General (incl farm travel)	0.05	0.00	0.05	0.00	0.00	0.06	0.05	0.04	0.04
Total Other Farm Working Expenses	**1.37**	**1.16**	**0.80**	**1.29**	**0.96**	**1.36**	**0.87**	**0.85**	**1.30**
Administration	0.15	0.08	0.09	0.19	0.07	0.05	0.07	0.19	0.12
Insurance	0.06	0.07	0.04	0.01	0.03	0.06	0.06	0.05	0.08
ACC	0.03	0.02	0.00	0.02	0.00	0.02	0.02	0.02	0.04
Rates	0.04	0.05	0.05	0.06	0.03	0.05	0.04	0.04	0.08
Depreciation	0.34	0.37	0.40	0.33	0.59	0.16	0.72	0.57	0.58
Total Overheads	**0.62**	**0.59**	**0.57**	**0.60**	**0.71**	**0.35**	**0.90**	**0.88**	**0.90**
Total Operating Expenses	**4.84**	**4.99**	**4.55**	**4.72**	**4.14**	**4.15**	**4.62**	**4.38**	**4.64**
Operating Profit	**2.72**	**2.41**	**2.74**	**2.44**	**3.52**	**3.11**	**2.94**	**2.83**	**2.73**
Farm Working Expenses Total	**4.39**	**4.63**	**4.15**	**4.39**	**3.74**	**3.90**	**3.56**	**3.78**	**3.62**

OPERATING PROFIT PER COW

Season 2017 2018	Davie Martin	Dry Creek	LUDF	Will-sden	Canlac	Terrace Holdings	Paddock Woods	Align Emilius	Grassy Banks
Milk Income (MS x $6.75)	3,233	3,148	3041	2934	3348	2371	3096	2918	2833
Dividend Income (MS x $0.15)	72	70	68	65	74	53	69	65	63
DairyNZ Levy (MS x $0.036)	17	17	-16	-16	-18	-13	-17	-16	-15
Total Milk Income	3,288	3,201	3093	2983	3404	2411	3148	2967	2881
Stock Sales	262	434	226	184	273	155	337	246	219
Stock Purchased	- 16	- 131	59	0	0	110	42	75	35
Stock Adjustment	70	- 112	23	-63	121	93	5	-34	29
Net Stock Income	317	191	190	121	394	137	300	137	213
Other Income	17	59	0	6	0	2	20	11	0
TOTAL INCOME	**3,622**	**3,452**	**3283**	**3111**	**3798**	**2550**	**3467**	**3116**	**3094**
OPERATING EXPENSES									
Wages	343	415	447	341	355	254	166	340	239
Labour Adjustment Unpaid	14	-	0	0	0	7	6	0	0
Labour Adjustment Management	27	-	0	0	0	20	124	0	128
Total Labour Costs	**384**	**415**	**447**	**341**	**355**	**281**	**296**	**340**	**367**
Animal Health	127	90	118	64	60	54	81	74	97
Breeding and Herd Improvement	32	91	94	61	56	42	38	54	60
Farm Dairy	10	22	16	23	8	27	48	17	1
Electricity (Farm Dairy and Water Supply)	47	54	51	28	37	33	15	34	34
Total Stock Expenses	**217**	**258**	**279**	**177**	**162**	**155**	**182**	**179**	**192**
Net Made / Purchased / Cropped	310	513	166	263	446	33	233	220	231
Feed Inventory Adjustment	11	- 2	0	0	-97	5	26	9	-62
Calf Feed	18	37	54	18	32	6	58	7	36
Total Supplement Expenses	339	548	220	281	381	44	317	237	205

Season 2017 2018	Davie Martin	Dry Creek	LUDF	Will-sden	Canlac	Terrace Holdings	Paddock Woods	Align Emilius	Grassy Banks
Young stock grazing	-	292	219	192	200	212	223	0	0
Winter cow Grazing	85	-	268	237	126	166	288	390	0
Support Block lease	337	-	0	0	0	0	0	0	143
Owned Support Block Adjustment	-	-	0	0	0	0	0	0	118
Total Grazing and Support Block Expenses	422	292	487	429	326	378	512	390	260
TOTAL FEED Expenses	**761**	**840**	**706**	**709**	**708**	**422**	**829**	**627**	**466**
Fertilizers	143	103	55	134	48	77	76	178	172
Nitrogen	135	87	74	0	79	101	69	0	0
Irrigation (electricity / rates)	74	84	82	310	230	140	72	51	139
Regrassing	12	90	19	37	7	16	1	12	10
Weeds and Pests	1	1	0	2	0	5	4	7	1
Vehicle	131	70	15	8	17	29	17	33	57
Fuel	-	-	17	17	17	19	29	0	32
R&M land and buildings	135	102	40	41	31	41	102	0	107
R&M Plants and equipment	-	-	38	12	45	28	6	66	14
Freight and General (incl farm travel)	26	2	22	0	0	22	22	18	15
Total Other Farm Working Expenses	**657**	**539**	**361**	**561**	**474**	**477**	**398**	**365**	**546**
Administration	71	38	39	81	33	19	30	83	49
Insurance	28	32	17	5	14	23	28	22	339
ACC	16	11	0	7	0	7	8	11	17
Rates	18	24	21	26	15	19	17	18	33
Depreciation	163	171	179	144	293	55	329	248	245
Total Overheads	**297**	**276**	**256**	**263**	**354**	**122**	**412**	**381**	**377**
Total Operating Expenses	**2,317**	**2,328**	**2049**	**2052**	**2053**	**1458**	**2117**	**1893**	**1948**
Operating Profit	**1,305**	**1,123**	**1234**	**1059**	**1745**	**1092**	**1350**	**1223**	**1146**
Farm Working Expenses Total	**2,100**	**2,159**	**1870**	**1908**	**1857**	**1371**	**1632**	**1636**	**1519**

SIDDC sincerely thanks the benchmark farm group and their staff for their willingness to provide their data and the time given in providing this material, to us and the dairy sector.

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