



SIDDC
South Island Dairying
Development Centre

Partners Networking
To Advance South
Island Dairying



Lincoln University
Te Whare Wānaka o Aoraki
CHRISTCHURCH - NEW ZEALAND

Dairynz



Ravensdown

LIC

Plant & Food
RESEARCH
RANGAHAU AHUMARA KAI

agresearch



Phone: +64 3 423 0022

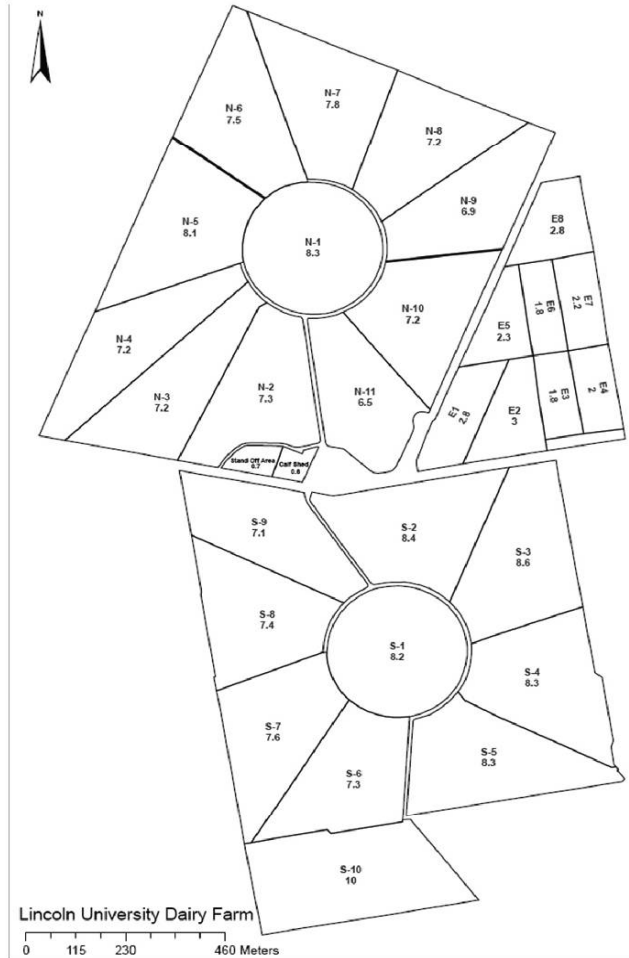
Fax: +64 3 325 3615

Email: office@siddc.org.nz

www.siddc.org.nz

Lincoln University Dairy Farm Focus Day

July 2015



Staff

Peter Hancox – Farm Manager
Matt Weatherhead – 2IC
Alistair Linfoot – Dairy Assistant
Matthew Costello – 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

Please follow instructions given by event organisers or farm staff

Introduction

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

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

The stocking rate increased to between 4 and 4.3 cows per ha or 654-683 cows peak milked. Production averaged 1700kgMS/ha and 411kgMS/cow. LUDF ran a single herd, the focus was simple systems, low and consistent grazing residuals.

Stage 3: 2011/12 to 2013/14

The strategic objective (below) was implemented in a move into 'Precision Dairying'. This focused on minimum standards not averages, two herds, higher productivity and initially higher profitability from a similar environmental impact. Production lifted to 1878kgMS/ha or 477kgMS/cow from 630 cows. The temporary suspension of Eco-n (DCD) in 2013 required a change in farm practice in 2013/14 in the attempt to hold nitrogen losses without the mitigation effect of Eco-n.

Stage 4: 2014/15

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 2011-2015:

To maximise sustainable profit embracing the whole farm system through:

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

Additional objectives

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

Farm area

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

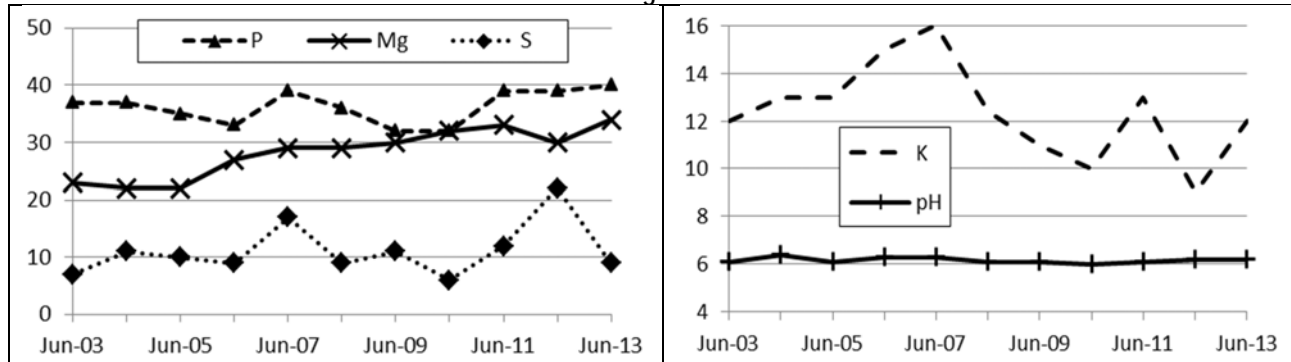
Soil types

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

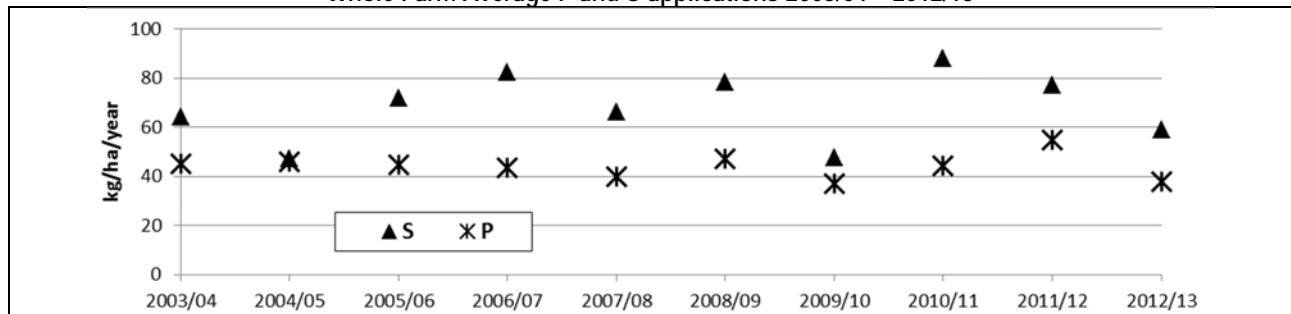
Soil test results and Fertiliser Applications

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

Whole Farm Average Soil Test Results



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



Pasture

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

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

SIDDC South Island Dairying Development Centre
 Partners Networking To Advance South Island Dairying

Lincoln University, DairyNZ, Ravensdown, LIC, Plant & Food Research, agresearch, SIDE

Staffing & Management

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

Milking Times - cups on 5.00am / 2.30pm

Irrigation and effluent system

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

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

Effluent

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

Mating programme – Spring 2014

KiwiX DNA for 325 cows (F8-F16); Holstein Friesian Daughter Proven for 235 cows (F0-F7); KiwiX Premier Sires in main herd then follow with Jersey bulls yearling Heifers. Natural mated with Jersey bulls for 9 weeks. Heifers start mating 10 days early. 10 weeks mating for milking herd. Expect to rear 125 heifers.

Herd details – October 2014

Breeding Worth 143 / 49% (rel%) / Production Worth (rel%)181 / 74% Recorded Ancestry 99%

Average weight / cow (Dec) – Herd monitored walk over weighing 480 kg [Dec 2014]

Calving start date Heifers – 23 July, Herd 3 August 2014

Est Median calving date 16 August 2014

Mating start date 25 October 2014

Empty rate (nil induction policy) after 10 weeks mating - 13% (2014-15 mating). 6 week in-calf rate 73%.

	2002/03	03/4-06/7	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Total kg/MS supplied	228,420	277,204	278,560	261,423	273,605	264,460	297,740	300,484	276,019	278654
Average kg/MS/cow	381	425	409	384	415	395	471	477	440	498
Average kg/MS/ha	1414	1720	1744	1634	1710	1653	1861	1878	1725	1742
Farm Working Expenses / kgMS	\$2.98	\$2.68	\$3.37	\$3.88	\$3.38	\$3.86	\$3.91	\$3.84	\$4.28	\$3.87
Dairy Operating Profit/ha	\$1,164	\$2,534	\$8,284	\$2,004	\$4,696	\$6,721	\$4,553	\$4665	\$7578	\$1200
Payout [excl. levy] \$/kg [Milk price + div.]	\$4.10	\$4.33	\$7.87	\$5.25	\$6.37	\$7.80	\$6.30	\$6.12	\$8.50 F	\$4.60
Return on Assets	4.4%	6.18%	14.6%	4.8%	7%	7%	6%	6%	10%	1.6%
1 July cow numbers	631	675	704	704	685	694	665	650	650	580
Max. cows milked	604	654	680	683	660	669	632	630	628	560
Days in milk			263	254	266	271	272	273	259	263
Stocking rate Cow equiv. / ha	3.75	4.05	4.2	4.3	4.13	4.18	3.95	3.94	3.92	3.5
Stocking rate Kg liveweight / ha	1,838	1964	2,058	2,107	1,941	1914	1860	1878	1872	1680
No. Cows / Weeks wintered off	500 / 8	515 / 7.8	546 / 9	547 / 7	570 / 9	652/ 8.4	650 / 9.8	650/9.8	650/11.4	580/10.7
No. Yearlings grazed On / Off	0/118	0/157	0/171	0/200	0/160	0/166	0/141	0/138	0/140	0/126
No. Calves grazed On / Off	0/141	0/163	0/200	0/170	0/160	0/194	0/190	0/156	0/150	0/126
Past Eaten (Dairybase) (tDM/ha)			17.9	17.2	16.2	16.9	17.3	16.8	14.9	15.7
Purch. Suppl - fed [kgDM/cow]	550	317	415	342	259	463	359	434	506.8	300
Made on dairy/platform [kgDM/cow]	0	194	95	64	144	160	154	93	0	40
Applied N / 160 eff. Ha			164	200	185	260	340	350	250	143



Partners Networking To Advance South Island Dairying









Contents

LUDF Results – 2014/15 season review 6#

 LUDF Strategic Objective 2011-2015 6#

 Summary of Performance - Full Year Results: 7#

 Comparing LUDF results between 2013/14 and 2014/15: 7#

Profitability Analysis - Comparison of Expenses and Profitability across six Canterbury farms 13#

 2014/15 Income and Expenses expressed per hectare (of milking platform) 23#

 2014/15 Income and Expenses expressed per kgMS 25#

Lincoln University Dairy Farm - Farm Walk notes 27#





South Island Dairying
Development Centre

Partners Networking To Advance South Island Dairying









LUDF Results – 2014/15 season review

LUDF Strategic Objective 2011-2015

To maximise sustainable profit embracing the whole farm system through:

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

2011/12 to 2013/14

The strategic objective (above) was implemented in a move into 'Precision Dairying' in the 2011/12 season. This focused on minimum standards not averages, two herds, higher productivity and initially higher profitability from a similar environmental impact. Production lifted to 1878kgMS/ha or 477kgMS/cow from 630 cows.

The temporary suspension of Eco-n (DCD) in 2013 required a change in farm practice in 2013/14 in the attempt to hold nitrogen losses without the mitigation effect of Eco-n. The farm had to cull its of surplus cows early in Autumn 2014 to meet the farms N-loss target (at a cost of \$84,000 in loss profit).

2014/15

LUDF adopted a 'Nil-Infrastructure, low input' farm system emerging from the P21 (Pastoral 21) research programme, in response to the tightening environmental requirements of some catchments across NZ, and to meet its historical N-loss (as above). The system comprises:

- 3.5 cows/ha,
- 150kgN/ha,
- 300kgDM/cow imported supplement, plus winter most cows off farm.

In addition the plan budgeted

- FWE of less than \$1.12million,
- Target production of 500kgMS/cow, resulting in a
- Target profitability of \$4000/ha at long-term average milk pay-out of \$6.30/kgMS. (\$1238/ha at \$4.75/kgMS (milk price + dividend))

In essence LUDF has upscaled results from P21 – LSE herd where 3 years of data have shown similar total production and profit was achieved with less total N-leaching than had occurred at LUDF.



Summary of Performance - Full Year Results:

	2012/13	2013/14	2014/15	P21 – LSE (3 yr ave)
Total kgMS sold	300,484	276,019	278,654	
Stocking Rate (Peak cows)	3.94	3.92	3.5	3.5
kgMS /peak cow	477	440	498	510
Milk Production /ha	1878 kgMS/ha	1725 kgMS/ha	1741 kgMS/ha	1782 kgMS/ha
Total N fert applied	350 kgN/ha	250 kgN/ha	143 kgN/ha	159 kgN/ha
Total Silage Fed tDM	294	319	165	
Total Silage Fed / peak cows (kgDM/cow)	434 kgDM	507 kgDM	300 kgDM	260 kgDM
Dec. ave LWT	477	478	485	507
kgMS/kg LWT	100%	92%	103%	101%
Estimated N leaching (full year – Overseer 6.2)	53	41	35	n/a
Farm Working Expenses	\$3.84	\$4.28	\$3.87	n/a
Estimated Pasture Harvested (DairyBase)	16.8	14.9	15.7	15.1

Note: Estimate N-losses are indicative only. 2012/13 results shown with the effect of Eco-n (as used)

Comparing LUDF results between 2013/14 and 2014/15:

LUDF has produced

- 1% more milk this season,
- from 11% fewer cows with the use of
- 43% less nitrogen fertiliser and
- consuming 48% less imported silage.
- Farm Working Expenses were also 10% lower than 2013/14.

By comparison to the Research Dairy Farm, P21 LSE farmlet trial, LUDF has produced 2.5% less milk, for a similar amount of N-fertiliser. LUDF has used more imported silage BUT has regrassed 3 paddocks (15% of the farm) whereas the Research Farmlet has not undertaken any regrassing.

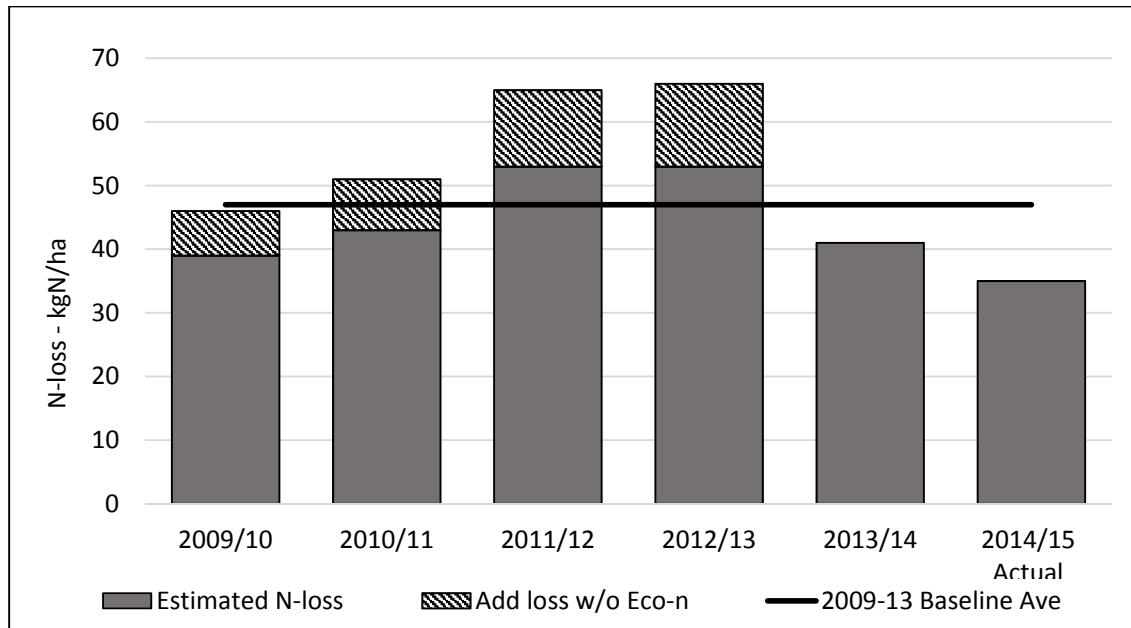
SUMMARY:

Its possible to reduce bought in feed and bought in N-fertiliser, if the stocking rate is also reduced appropriately to balance feed supply with feed demand.

Reducing N-fertiliser, bought in silage and stocking rate reduces costs: - total milk production (from pasture) remains important to maintain profitability.



Figure 1: Overseer® v6.2 Estimated N-loss per hectare



Note: N-losses are indicative only.

On-farm management aspects of the reduced input farm system:

The following graphs provide a pictorial view of the use of N-fertiliser (Fig 2), supplements (Fig 3), total area mown (Fig 4) and resultant milk production (Figures 5 and 6) over the past seasons, while Table 2 below details some of the changes in farm practice that have occurred to implement the Nil-infrastructure, lower input farm system. LUDF has identified changes that it believes can be improved to further enhance the operation of this system, which it seeks to implement in the coming season.

Figure 2: Cumulative N Fertiliser Use:

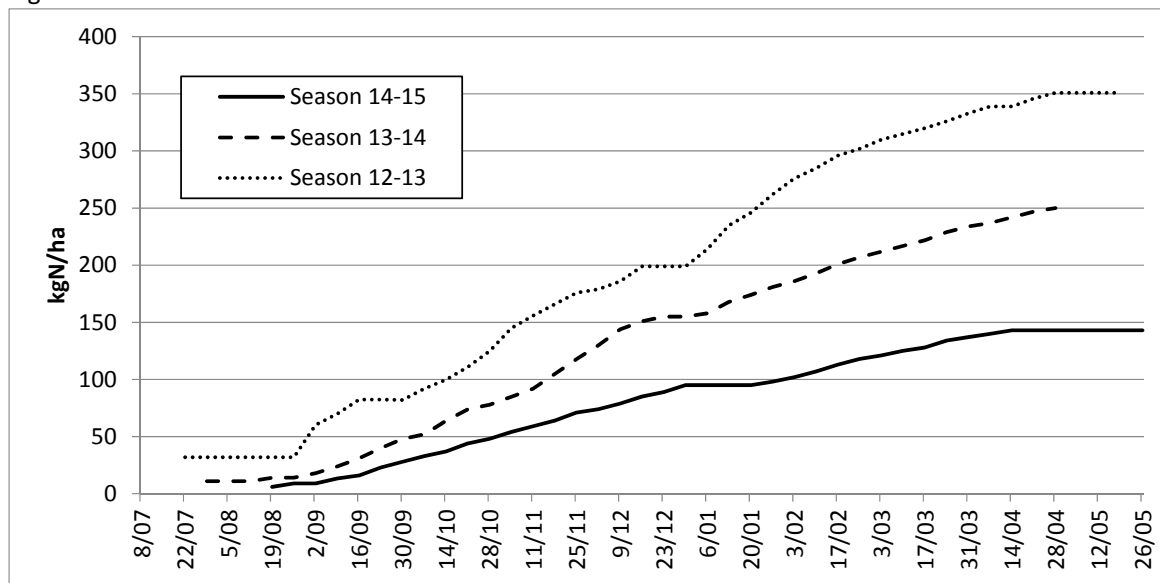


Figure 3: Imported Supplements fed (kg DM/peak cow)

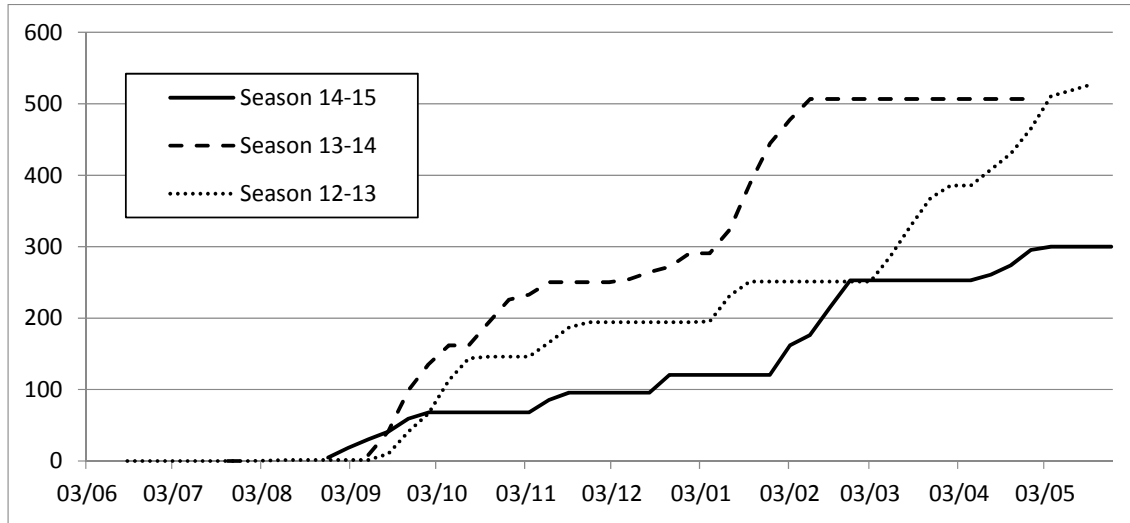


Figure 4: Total Area mown (includes silage and mowing of new pasture for weed control)

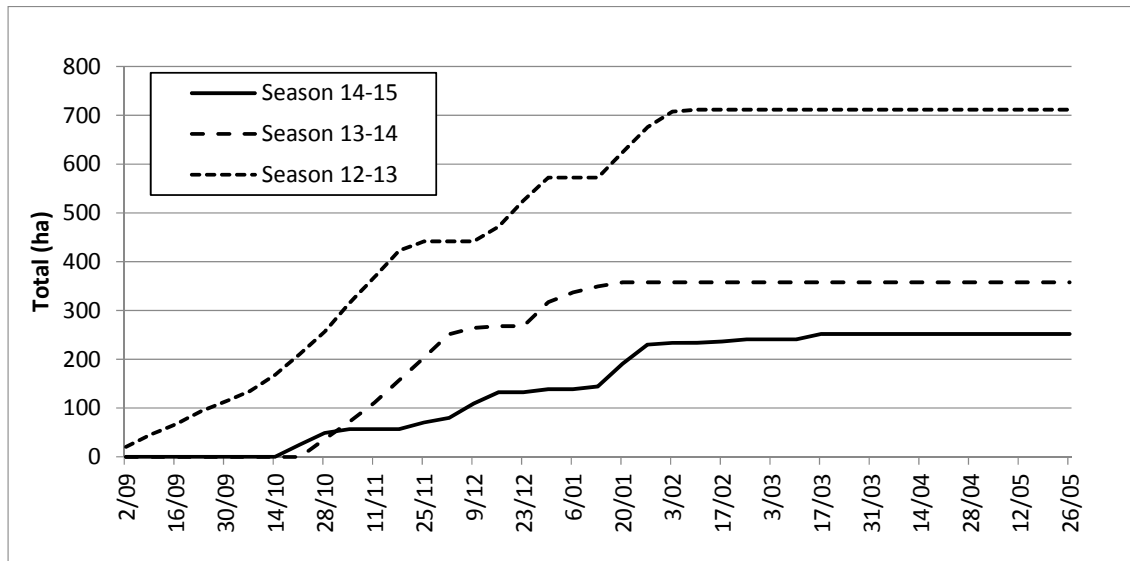


Figure 5: Average milk production per cow (kg MS/peak cow)

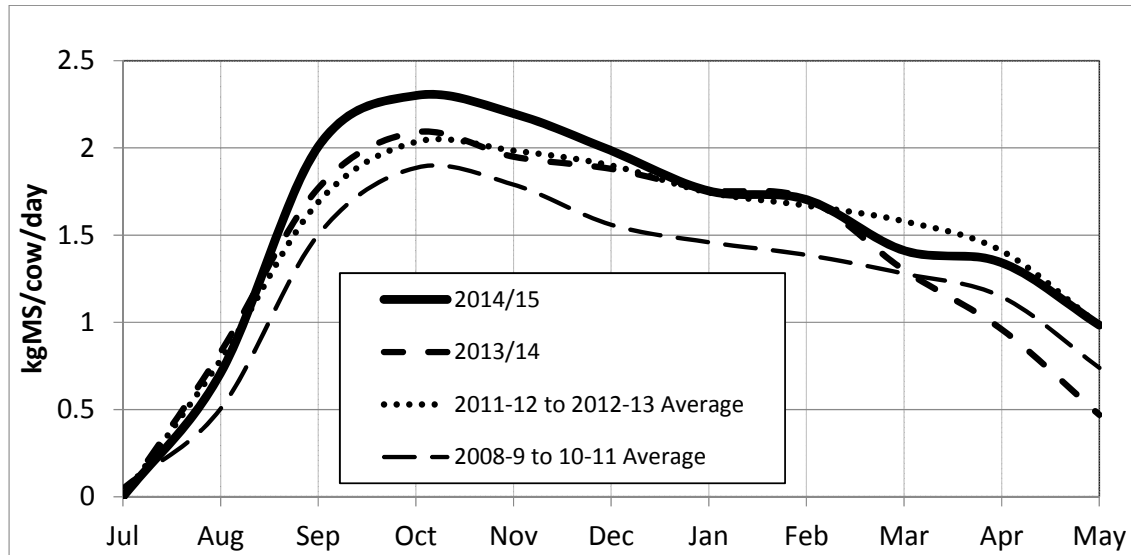


Figure 6: Average milk production per hectare (kg MS/ha)

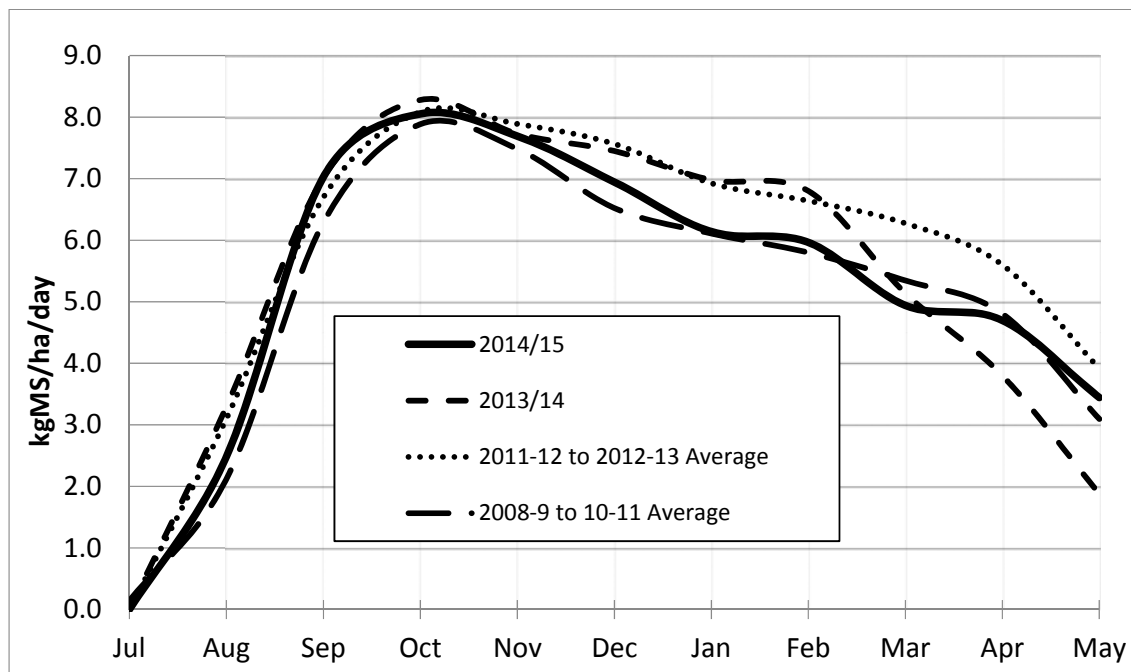


Table 2: Summary – Changes to Management at LUDF

	Historically	2014/15 Season
1. Spring Rotation Planner (SRP)	Used in conjunction with silage, N fert and GA, typically finishing mid-September	Proactively managed SRP and held out end first round to 23 September.
2. Rotation Length	Average 22 days Sept – Jan 27 days Sept 22 days Oct - Nov 19 days Dec – Jan 22 days Feb 22 days March 33 days April 11 grazing rounds since beginning September	Average 26 days Sept - Jan 39 days Sept 23 days Oct – Nov 21 days Dec – Jan 23 days Feb 33 days March 38 days April 9.5 grazing rounds since beginning September (14% fewer grazings)
3. Average Pre-Graze Cover	3118 kg DM/ha (average Sept – Jan) 3435 kg DM/ha (average Feb – April)	3328kg DM/ha (average Sept – Jan) 3625 kg DM/ha (average Feb – April)
4. Average Post Grazing Cover	1607 kg DM/ha till end Jan 1690 kg DM/ha Feb – April	1652kg DM/ha till end Jan 1676 kg DM/ha Feb - April
5. Nitrogen Fertiliser Use	200-350 kg N/ha year	143 kg N/ha/year (intention was no more than 150kgN/ha)
a. Frequency of N-fertiliser application	Before calving on paddocks with less than 2200 kg DM/ha, then after every grazing, limited use mid-Summer	No N pre-calving, Following each grazing till end December, start again end January. Slower Grazing Rotation means less frequent N applications (14% decrease)
b. Rate	25-40 kg N/ha/application	25 kg N/ha/application
6. Regrassing	Typically 3 paddocks	3 paddocks regrassed. With hindsight this put too much pressure on the farm and the plan is to reduce this to 10% regrassing in the coming season.
7. Gibberellic Acid	Apply immediately following grazing from late August till late September / early October and again in the March / April period based on suitable conditions.	As previously used, except that slower grazing rotations result in less ability to apply in a timely manner following grazing.
8. Tight Cost Control	Good cost control to keep total expenses low without eroding the future profitability of the farm. High and efficient production from pasture then offsets farm working expenses to produce a lower than average operating cost and a sustainable profit (depending on pay-out).	

Continued...




SIDDC South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying









9. Weekly Farm Walk	Actively measure pasture cover weekly, calculate APC, predict future cover, plan and respond to surplus / deficits
10. Pasture Allocation	Allocate daily area /cow based on Farm walk / APC, milk production, cow response, grazing residual
11. Split Herd	<p>Split herd based on 1/3 - 2/3 split with small herd initially comprising heifers and light CS MA Cows. Through late spring some well-conditioned heifers were moved into the main herd and replaced with light MA cows.</p> <p>Following the early pregnancy scan, light BCS, early calving cows have replaced later calving and / or better BCS heifers. At the end of lactation the small herd may become a group of higher BCS / later calving cows or be merged with the main herd based on rotation length / desired grazing pressure.</p>
12. BCS based drying off protocol	Frequent BCS including adhering to BCS targets for drying off based on current CS and days remaining till calving. Milk production is not / will not be chased at the expense of BCS targets (per individual cow) at calving.
13. Herd Test to identify cow performance and disease risk such as Johnes	Routine herd testing allows identification of low producing cows, particularly important when considering drying off low producing cows.
14. Heifer mating 2 weeks prior to MA cows	Mating heifers early at LUDF has become part of the successful lift in 6-week InCalf results – as this allows the freshly calved heifer more time to cycle and get back in calf in a timely manner.




SIDDC South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying


Lincoln University
Te Whare Wānanga o Aoraki
 CHRISTCHURCH NEW ZEALAND













Profitability Analysis - Comparison of Expenses and Profitability across six Canterbury farms

LUDF, in conjunction with DairyNZ is fortunate to have a range of well-respected highly profitable dairy farms across Canterbury who make their farm physical and financial results available to provide an annual benchmark of performance.

The following table highlights the key parameters of each farm, along with a range of performance measures. In addition to the details below, each farm has its own constraints and opportunities; the results below are the outcome of how each farm has chosen to operate in the past 12 months, given the climate, market and their own circumstances. For LUDF, this includes voluntarily endeavouring to lower its N-leaching (as above).

SEASON 2014-15	Jefferson	Acton	Davie-Martin	Melrose	LUDF	Willsden	Dry Creek
Location	Hinds	Rakaia	Culverden	Ealing	Lincoln	Te Pirita	Culverden
Effective ha (MP)	140	174	141	705	160	306	160
Run Off	102	-	90	219	-	-	-
Cows	560	680	557	2,644	560	1,065	542
SR	4.0	3.9	4.0	3.8	3.5	3.5	3.4
kgMS	282,561	276,593	286,440	1,247,273	278,654	472,758	275,669
kgMS/Cow	505	407	514	472	498	444	509
kg MS/ha	2,018	1,590	2,031	1,769	1,742	1,545	1,723
MS as % of liveweight	100	81%	103%	98%	104%	94%	108%
10 day peak	2.27	1.83	2.34	2.24	2.31	2	2.4
DIM	264	267	267	262	263	268	253
%drop peak to 31 Dec.	9.50%	5.20%	6.80%	9.20%	4.40%	5.10%	6.90%
Pasture and crop eaten t/ha	16.8	16.9	16.9	16.6	15.7	13.1	13.6
Imported feed t/ha	3.0	0.8	3.7	1.2	0.9	2.5	2.9
Grazing off dry cows	3.7	2.3	2.7	3.0	3.2	3.0	2.9
Total feed eaten	23.4	20	23.3	20.8	19.8	18.6	19.4
N use kg/ha	316	287	309	255	143	261	290
Length of AB	6	5	11	6	6	6	12
% treated for non-cycling cows	11%	0	15%	3%	0%	0%	15%
6 week-InCalf rate	75%	65%		70%	72%	69%	62%
Not InCalf rate	9%	13%	12%	13%	14%	11%	18%



Partners Networking To Advance South Island Dairying



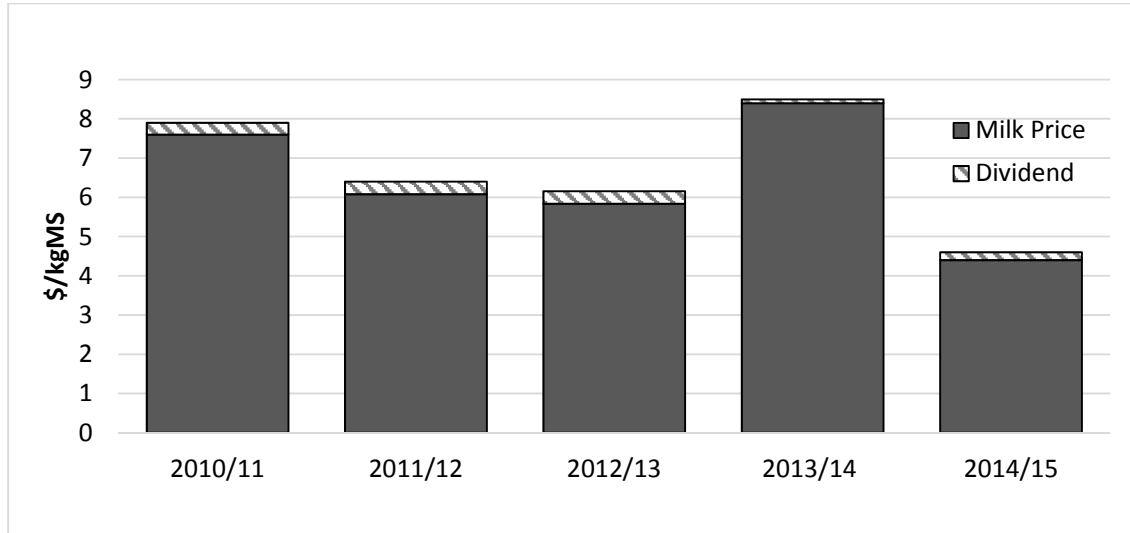






Milk income remains the major driver of actual profitability per year. Figure 7 shows the range in total milk income (milk price and dividend) earned per season.

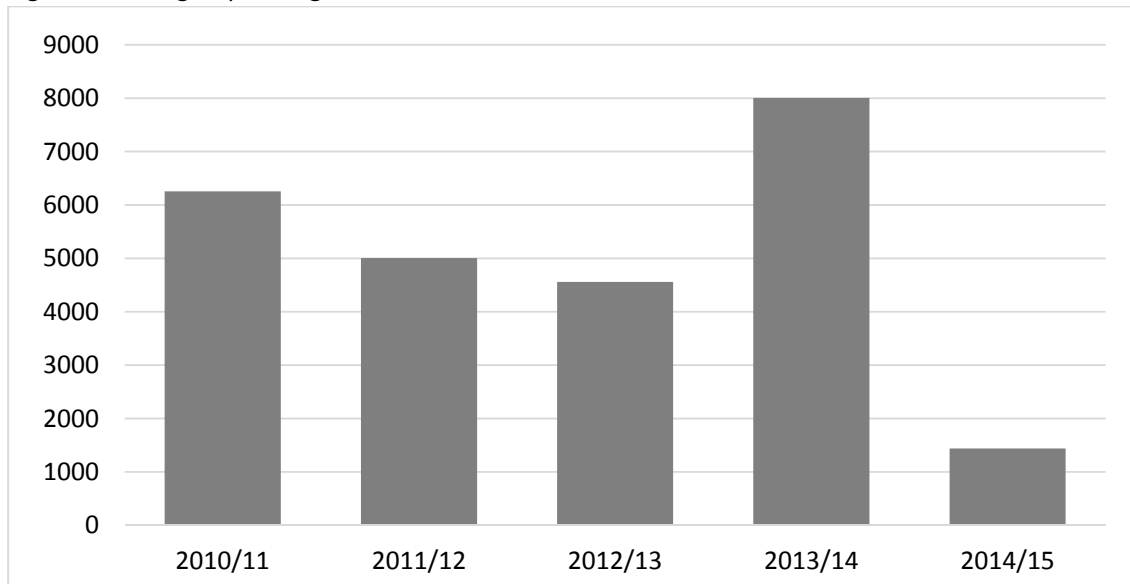
Figure 7: Milk price and dividend per year



Profitability below is calculated based on milk production x full year forecast milk income, ignoring any retrospective payments, and assuming one share is held for each kilogram of milk solids produced. Figure 8 reports the average profitability of the benchmark farms over the past 5 seasons. Reported profitability includes depreciation and adjustments for changes in livestock numbers, feed inventory and management wages.

Note the number of farms contributing to the benchmarking dataset has changed over time, with the average per year reflecting the data available that year, rather than the average of all farms currently in the dataset.

Figure 8: Average Operating Profit of all benchmark farms over time.



Calculation and adjustments required in determining Profit

The following table highlights the adjustments required when calculating profit for LUDF. Data from each of the farms in the benchmark analysis is treated similarly to accommodate the following changes

- Differences between opening and closing stock numbers and feed levels,
- Owned Support land
- Wages of management and
- Depreciation

DairyBase protocol is used for all these adjustments, which provides a consistent methodology to adjust for wages based on herd size, average feed cost and IRD livestock values. These aspects may over or under estimate the impact of these on any individual farm, but in all cases provides a consistent approach.

	LUDF Cash Costs	Adjusted LUDF data when calculating operating Profit
Milk Income + Dividend (less levy)	\$4.56/kgMS	\$4.56/kgMS
Livestock Sales - purchases	\$115,088	
Stock Adjustment		-\$5315
Total Income	\$1,386,867	\$1,381,552
Farm Working Expenses	\$1,078,027	\$1,078,027
Labour Adjustment		-
Feed Adjustment		-
Owned Support Land		-
Depreciation		\$116,000
Total Operating Expenses		\$1,194,027
Cash Surplus	\$308,840 (\$1930/ha)	
Operating Profit		\$187,525 (\$1172/ha)

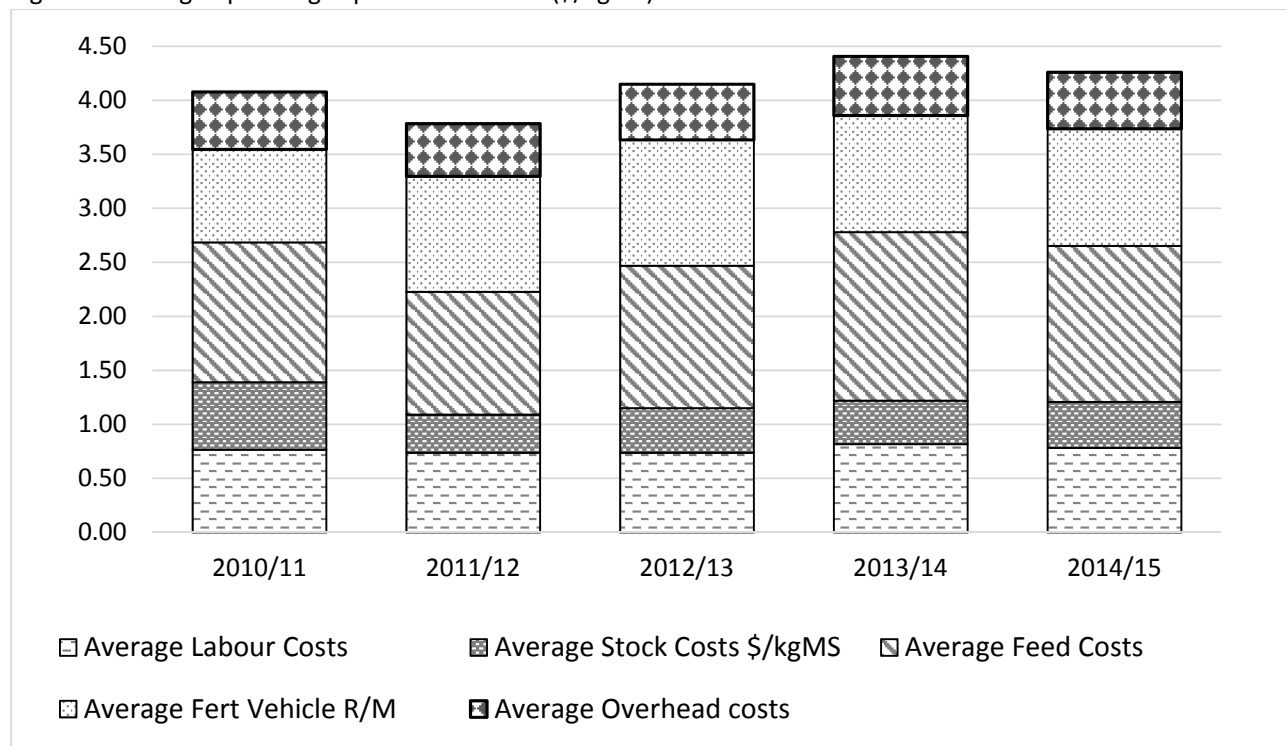
Across the farms within the following analysis, the range of total adjustments varies from \$436/ha to \$2287/ha. Changing the values associated with these adjustments could therefore markedly change the calculated operating profit.



Total operating expenses, expressed per kgMS, have on average largely been held constant in the benchmark group of farms over the duration of this analysis. This is partially the result of a small but steady increase in production creating additional dilution over time. Within total expenses however there are a number of interesting changes:

- Labour and livestock related costs are generally static,
- Feed costs have generally risen over time and are now the largest group of costs identified above
- Fertiliser, vehicle costs, regrassing and R/M have varied over time but are typically lower than in the earlier period of this analysis
- Overhead costs are also largely being held at a constant level per kg MS.
- Within the above data, some costs may have moved categories over time as greater emphasis has been placed on coding expenses to specific activities.

Figure 9: Average operating Expenses over time (\$/kgMS)



For simplicity the categories above reflect the DairyBase coding of Labour, Stock, Feed, Other and Overhead Expenses. In this analysis, Other has been renamed 'Fert Vehicle R/M' to better define its grouping. These categories can be further broken down as follows:

Labour:

- Wages (including Housing)
- Unpaid labour adjustment
- Management adjustment

Stock:

- Animal health
- Breeding and herd Improvement
- Farm Dairy
- Electricity (Farm dairy and water supply)

Feed:

- Supplements Made / Purchased / Cropped
- Feed Inventory Adjustment
- Calf Feed
- Young stock grazing
- Winter cow Grazing
- Support Block lease
- Owned Support Block Adjustment

(Other) Fert Vehicle R/M

- Fertilizers (including Nitrogen)
- Irrigation
- Regrassing
- Weeds and Pests
- Vehicle
- Fuel
- R&M land and buildings
- R&M Plants and equipment
- Freight and General (incl farm travel)

Overheads:

- Administration
- Insurance
- ACC
- Rates
- Depreciation

LUDF conducts this benchmarking exercise to measure its own performance and also to provide data on actual performance for other farms to benchmark against. The following set of graphs compare the position of LUDF against the range of performance of the remaining farms in the analysis. The grey boxes represent the highest and lowest figures amongst the data set each year, while the black line identifies the LUDF position. Note these are visual representation of where the range of costs are for each category and as such can be swayed by a particular farm with either high or low costs for subset or category of the data.

Figure 10: Range of Operating Profit (compared to LUDF) (\$/kgMS)

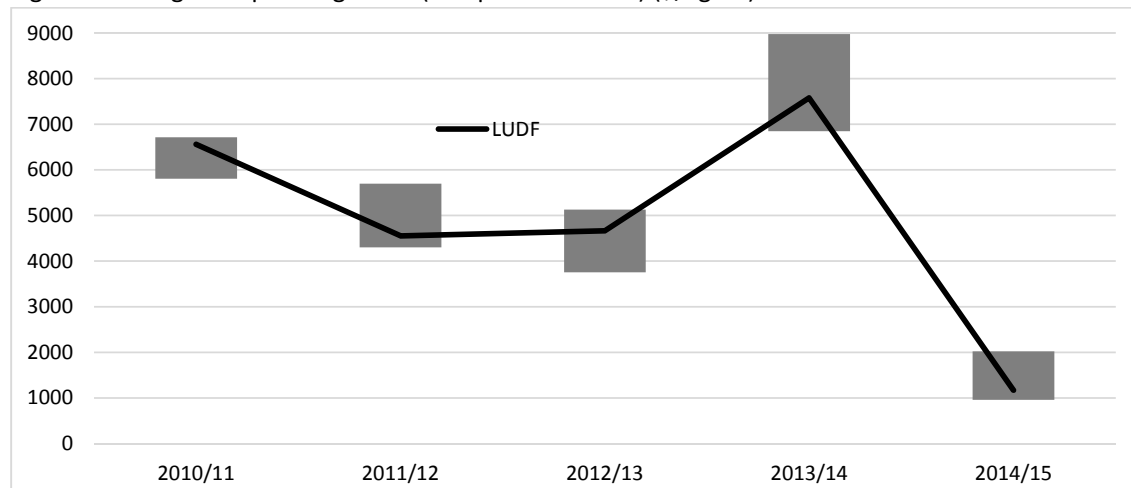


Figure 11: Range of Operating Expenses (compared to LUDF) (\$/kgMS)

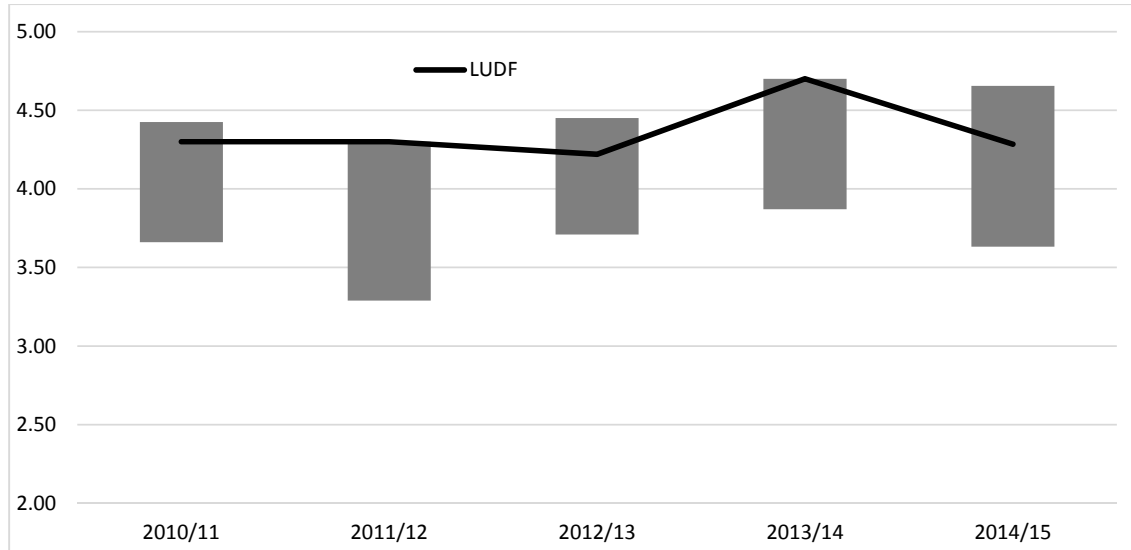


Figure 12: Range of Livestock / other Income (compared to LUDF) (\$/kgMS)

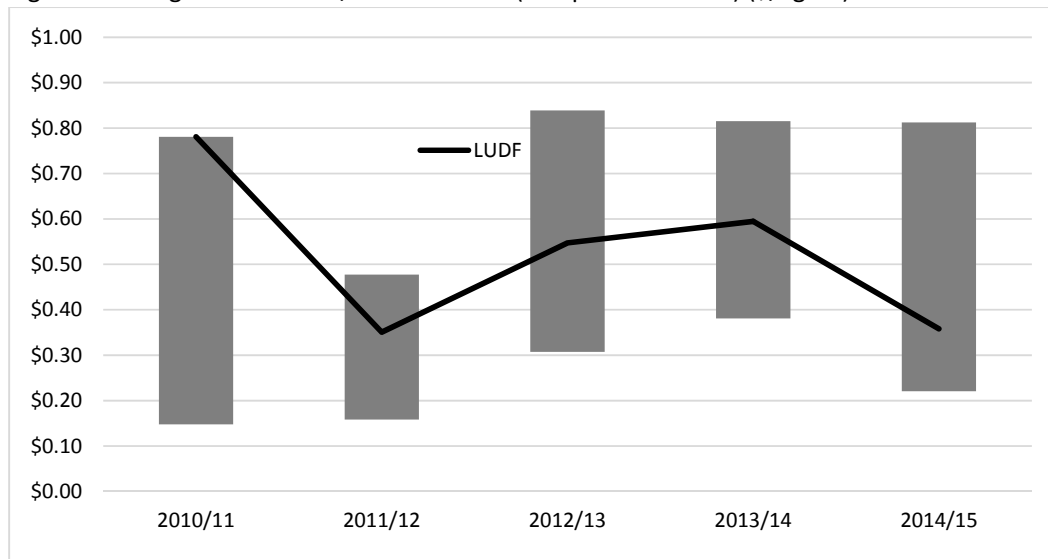


Figure 13: Range of Labour Costs (compared to LUDF) (\$/kgMS)

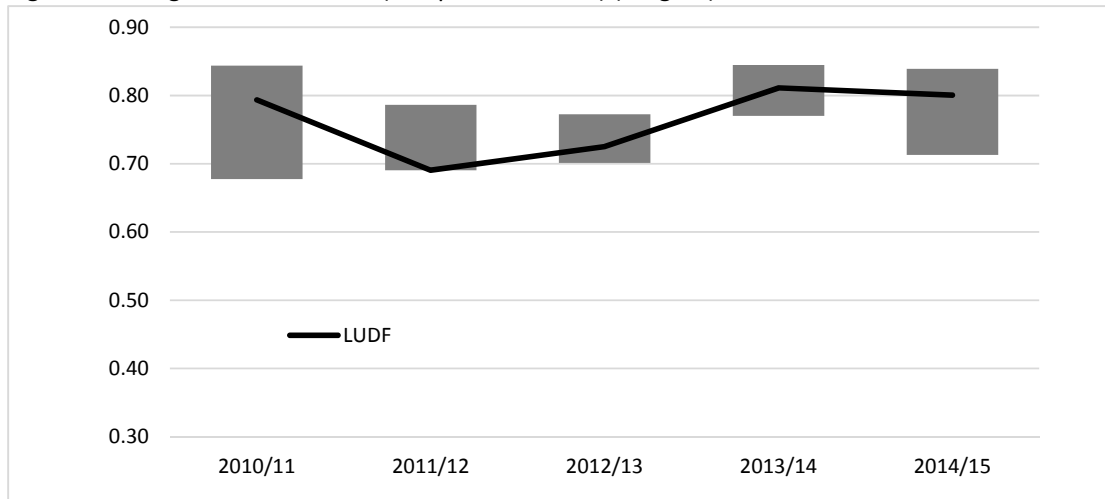


Figure 14: Range of Stock Costs (compared to LUDF) (\$/kgMS)

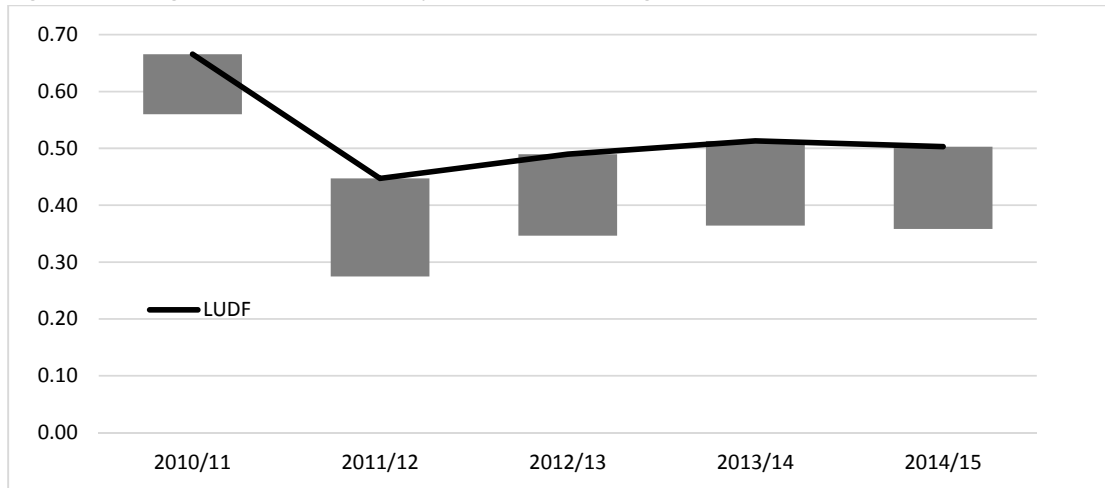


Figure 15: Range of Feed Costs (compared to LUDF) (\$/kgMS)

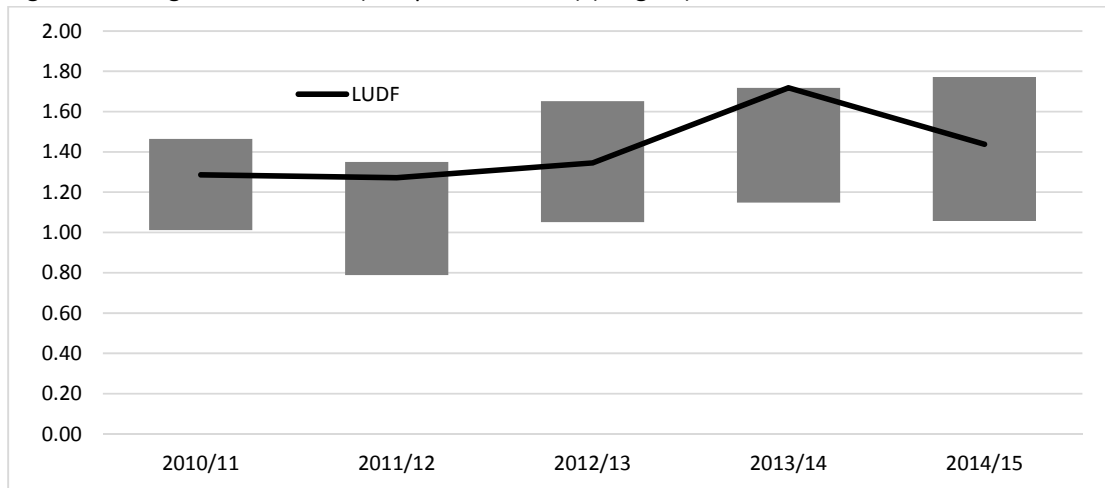


Figure 16: Range of Fert / Vehicle / RM (compared to LUDF) (\$/kgMS)

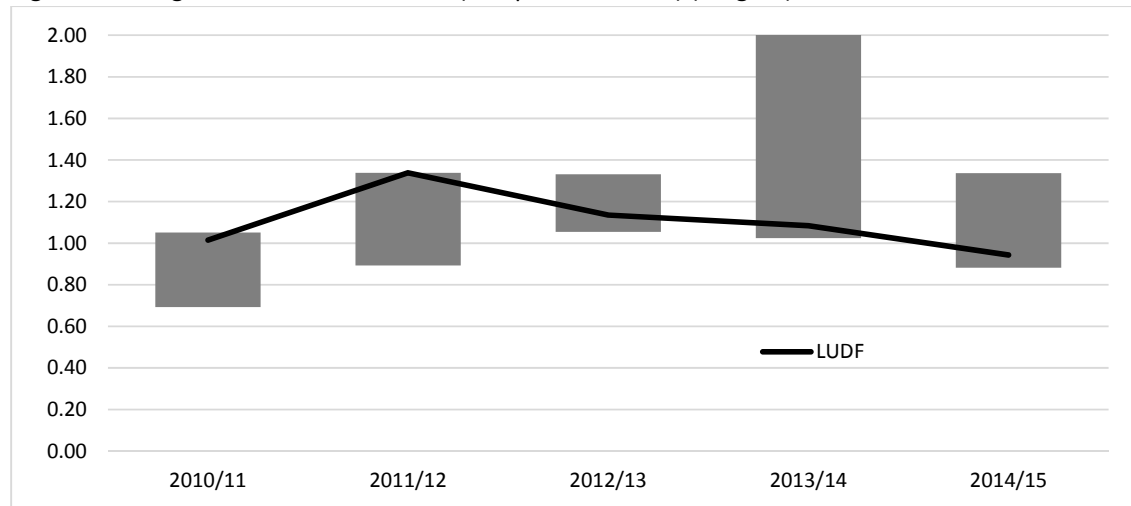
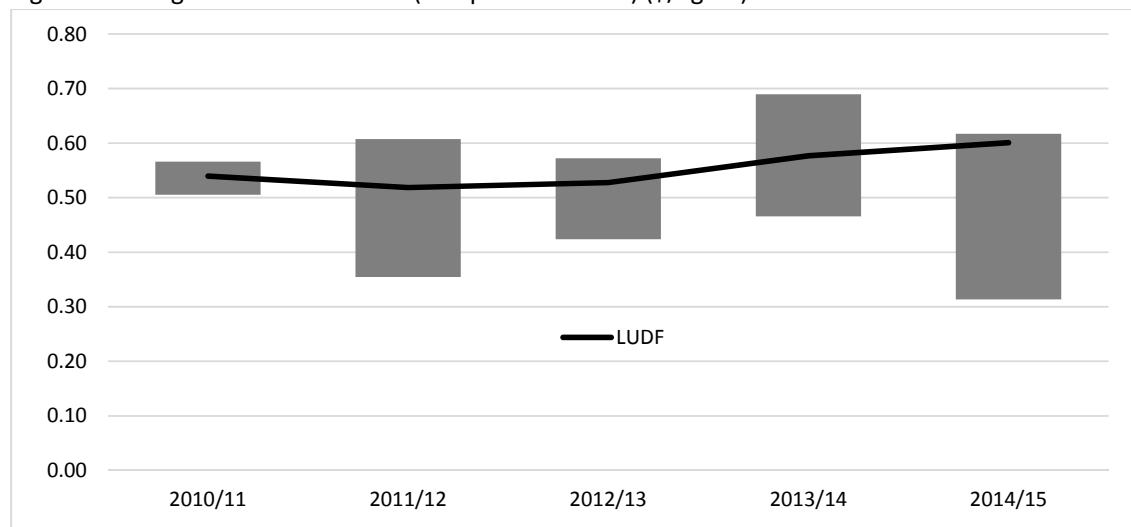


Figure 17: Range of Overhead costs (compared to LUDF) (\$/kgMS)

**Data Warning:**

1. Its possible to 'over-analyse' any of this data. For simplicity data is grouped which can mask some of the uniqueness of individual farms. Data is also averaged where possible to aid the presentation, but averaging can lessen the value.
2. Low farm working expenses don't always equal low operating expenses (and vice versa), particularly if there are significant adjustments in feed inventory, livestock numbers over the year, or labour adjustments.
3. Note also in the following graph, high profitability can occur with higher expenses, while low operating expenses can also contribute to high profitability. For example, the highest profit per hectare and per kgMS occurred at Jeffersons, which also had high operating expenses per ha and per kgMS.

- Similar profitability (per ha) was achieved by Acton and Melrose, Acton had low FWE and low operating expenses per hectare, whereas Melrose had much higher costs (over \$1000/ha additional expenses for a similar profit per hectare).

Figure 18: Profit vs Operating Expenses per ha and per kgMS (compared to LUDF) (\$/kgMS)

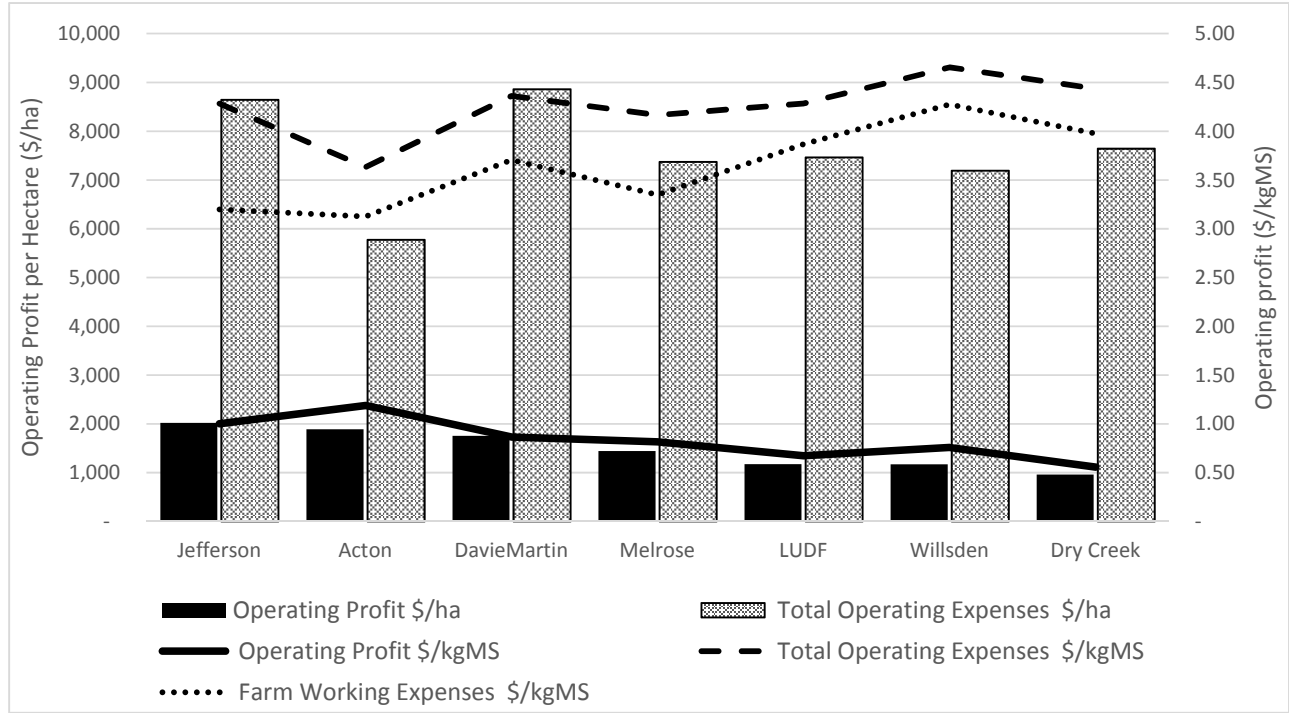
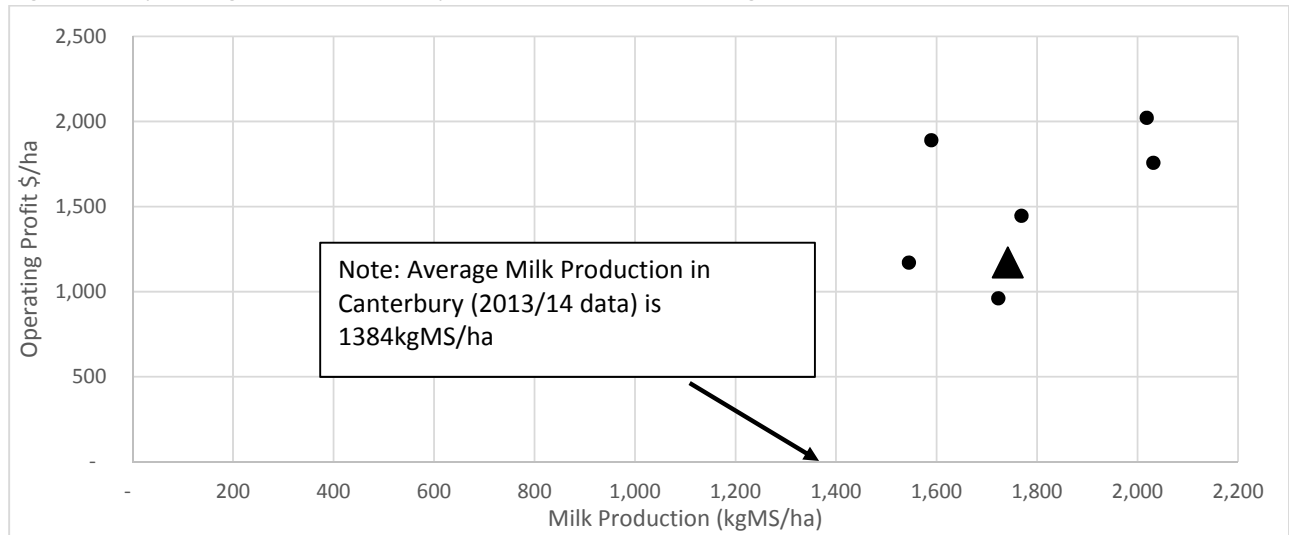


Figure 19: Operating Profit (\$/ha) compared to Milk Production (kgMS/ha)



Production does not signal profitability, however all farms are producing well above the regional average milk production per hectare.

The two highest profit farms (black squares above) also have the highest production of this group of farms. The farms represented by two stars above also have similar profit, but achieved this with a difference of 180kgMS/ha). LUDF, represented by the black diamond, had lower profitability than two farms with similar or lower milk production, indicating the production costs at these other farms were lower, relative to their production.

Figure 20: Comparison of Estimated feed eaten during lactation (Pasture, forage and imported supplements) with milk production per hectare of each farm.



2014/15 Income and Expenses expressed per hectare (of milking platform)

	Jefferson	Acton	Davie Martin	Melrose	LUDF	Willsden	Dry Creek
Milk income (\$4.40/kgMS)-levy	8,808	6,937	8,865	7,721	7,600	6,742	7,519
Dividends (\$0.20/kgMS)	404	318	406	354	348	309	345
Stock Sales	1,419	1,126	1,373	797	1,009	934	545
Stock Purchased	176	-718	- 83	98	289	0	- 28
Stock Adjustment	- 97	-	32	-	- 33	150	136
Net stock income	1,146	408	1,322	698	686	1,085	653
Other Income	309	-	25	42	-	226	87
TOTAL INCOME	10,666	7,663	10,618	8,815	8,635	8,362	8,604
Wages	1,129	859	1,170	1,294	1,394	1,101	1,342
Labour Adjustment Unpaid	30	-	50	20	-	-	-
Labour Adjustment Mngt	279	461	410	170	-	-	-
Total Labour Costs	1,439	1,320	1,630	1,484	1,394	1,101	1,342
Animal Health	406	147	402	337	357	191	300
Breedg / Herd Imprvmt	403	183	112	154	319	341	271
Farm Dairy	70	62	51	105	45	91	194
Electricity (Dairy / Water)	138	113	162	99	155	69	24
Total Stock Expenses	1,017	506	728	695	876	692	789
Net Made /Purch/Cropped	1,717	340	1,179	865	422	627	1,352
Feed Invent Adjmt	-39	28	-100	54	-	243	104
Calf Feed	47	33	81	56	261	148	82
Tot Supplement Expenses	1,725	401	1,160	975	683	1,018	1,539
Young stock grazing	-	-	106	-	713	732	708
Winter cow Grazing	7	1,397	1,112	429	1,107	877	806
Support Block lease	66	-	895	-	-	-	-
Owned Support Blk Adj	1,029	-	-	466	-	-	-
Tot Graze/ Sup Block Exp	1,102	1,397	2,114	895	1,821	1,609	1,514
TOTAL FEED Expenses	2,827	1,798	3,273	1,869	2,504	2,626	3,053

PTO



SIDDC South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying

Lincoln University
 DairyNZ
 Ravensdown
 LIC
 Plant & Food RESEARCH
 agresearch
 SIDE

	Jefferson	Acton	Davie Martin	Melrose	LUDF	Willsden	Dry Creek
Fertilizers	649	548	946	644	234	578	846
Nitrogen	403	-	-	245	242	-	-
Irrigation	307	360	299	460	315	905	265
Regrassing	112	23	-	182	151	221	37
Weeds and Pests	10	39	24	87	8	11	3
Vehicle	87	187	105	135	107	75	104
Fuel	145	-	169	58	62	-	92
R&M land and buildings	302	447	406	485	415	274	13
R&M Plants and Eqmt	83	-	-	69	63	-	138
Freight / Gen (farm travel)	20	48	104	-	46	-	22
Tot Other Farm Working	2,117	1,652	2,053	2,363	1,642	2,065	1,519
Administration	122	35	272	74	148	177	98
Insurance	139	93	73	74	59	85	93
ACC	-	-	-	6	42	36	-
Rates	94	54	60	67	72	65	62
Depreciation	891	316	773	736	725	343	688
Total Overheads	1,245	498	1,178	957	1,046	706	940
Tot Oper Expenses \$/ha	8,645	5,774	8,862	7,369	7,463	7,191	7,643
Farm Working Exps \$/ha	6,455	4,969	7,529	5,924	6,738	6,605	6,851
Operating Profit \$/ha	2,021	1,889	1,757	1,445	1,172	1,170	961




SIDDC South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying









2014/15 Income and Expenses expressed per kgMS

	Jefferson	Acton	Davie Martin	Melrose	LUDF	Willsden	Dry Creek
Milk income (\$4.40/kgMS)-levy	4.36	4.36	4.36	4.36	4.36	4.36	4.36
Dividends (\$0.20/kgMS)	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Stock Sales	0.70	0.71	0.68	0.45	0.58	0.60	0.32
Stock Purchased	0.09	-0.45	-0.04	0.06	0.17	0.00	-0.02
Stock Adjustment	-0.05	0.00	0.02	0.00	-0.02	0.10	0.08
Net stock income	0.57	0.26	0.65	0.39	0.39	0.70	0.38
Other Income	0.15	0.00	0.01	0.02	0.00	0.15	0.05
TOTAL INCOME	5.28	4.82	5.23	4.98	4.96	5.41	4.99
Wages	0.56	0.54	0.58	0.73	0.80	0.71	0.78
Labour Adjustment Unpaid	0.02	0.00	0.02	0.01	0.00	0.00	0.00
Labour Adjust Mngt	0.14	0.29	0.20	0.10	0.00	0.00	0.00
Total Labour Costs	0.71	0.83	0.80	0.84	0.80	0.71	0.78
Animal Health	0.20	0.09	0.20	0.19	0.21	0.12	0.17
Breed /Herd Improvmt	0.20	0.12	0.06	0.09	0.18	0.22	0.16
Farm Dairy	0.03	0.04	0.03	0.06	0.03	0.06	0.11
Electricity (Dairy/ water)	0.07	0.07	0.08	0.06	0.09	0.04	0.01
Total Stock Expenses	0.50	0.32	0.36	0.39	0.50	0.45	0.46
Net Made/ Purch/ Cropped	0.85	0.21	0.58	0.49	0.24	0.41	0.78
Feed Invent Adjustment	-0.02	0.02	-0.05	0.03	0.00	0.16	0.06
Calf Feed	0.02	0.02	0.04	0.03	0.15	0.10	0.05
Tot Supplement Expenses	0.85	0.25	0.57	0.55	0.39	0.66	0.89
Young stock grazing	0.00	0.00	0.05	0.00	0.41	0.47	0.41
Winter cow Grazing	0.00	0.88	0.55	0.24	0.64	0.57	0.47
Support Block lease	0.03	0.00	0.44	0.00	0.00	0.00	0.00
Owned Sup Blk Adj	0.51	0.00	0.00	0.26	0.00	0.00	0.00
Tot Graz Support Blk Exp	0.55	0.88	1.04	0.51	1.05	1.04	0.88
TOTAL FEED Expenses	1.40	1.13	1.61	1.06	1.44	1.70	1.77

PTO



SIDDC South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying









	Jefferson	Acton	Davie Martin	Melrose	LUDF	Willsden	Dry Creek
Fertilizers	0.32	0.35	0.47	0.36	0.13	0.37	0.49
Nitrogen	0.20	0.00	0.00	0.14	0.14	0.00	0.00
Irrigation	0.15	0.23	0.15	0.26	0.18	0.59	0.15
Regrassing	0.06	0.01	0.00	0.10	0.09	0.14	0.02
Weeds and Pests	0.00	0.02	0.01	0.05	0.00	0.01	0.00
Vehicle	0.04	0.12	0.05	0.08	0.06	0.05	0.06
Fuel	0.07	0.00	0.08	0.03	0.04	0.00	0.05
R&M land and buildings	0.15	0.28	0.20	0.27	0.24	0.18	0.01
R&M Plants / equipment	0.04	0.00	0.00	0.04	0.04	0.00	0.08
Freight Gen (farm travel)	0.01	0.03	0.05	0.00	0.03	0.00	0.01
Tot Other Farm Wkg Exps	1.05	1.04	1.01	1.34	0.94	1.34	0.88
Administration	0.06	0.02	0.13	0.04	0.08	0.11	0.06
Insurance	0.07	0.06	0.04	0.04	0.03	0.06	0.05
ACC	0.00	0.00	0.00	0.00	0.02	0.02	0.00
Rates	0.05	0.03	0.03	0.04	0.04	0.04	0.04
Depreciation	0.44	0.20	0.38	0.42	0.42	0.22	0.40
Total Overheads	0.62	0.31	0.58	0.54	0.60	0.46	0.55
Total Opertg Exp \$/kgMS	4.28	3.63	4.36	4.17	4.28	4.65	4.44
Farm Working Exp \$/kgMS	3.20	3.13	3.80	3.35	3.87	4.28	3.98
Operating Profit \$/kgMS	1.00	1.19	0.86	0.82	0.67	0.76	0.56



SIDDC South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying









Lincoln University Dairy Farm - Farm Walk notes

Tuesday 30-June 2015

LUDF – focus for 2015/16 Season: Nil-Infrastructure, low input, low N-loss, high profit.
 Farm system comprises 3.5 cows/ha (peak milked), 150kgN/ha, 300kgDM/cow imported supplement, plus winter most cows off farm. FWE of less than \$1.12million and Target production of 500kgMS/cow.

Critical issues for the short term

1. **Monitor cows on winter pasture and silage to achieve required condition score at calving**
2. **Monitor average pasture cover on the milking platform**
3. **Use back fences**
4. **Observing cows for signs of mastitis**

Key Numbers - week ending Tuesday 30 June 2015

Ave Past Cover	2076KgDM/ha	Past Growth Rate	1 kgDM/ha/day
Round length	615 days	Ave Supplement used	0 kgDM/cow/day
No Cows on farm	24	Ave Soil Temp (week)	3.6 degrees

Herd Management

5. We are currently managing 24 dry cows on farm
6. 122 of our light early calving cows went to winter grazing on Saturday 30th May. They are offered 16 Kg DM per cow made up of 14 kgDM grass and 2kgDM of silage. Another 225 cows went to winter grazing on the 3rd of June and are offered 14 Kg DM m
7. ade up of 12 kgDM of grass and 2kgDM of silage. These will be split into 2 mobs on calving date giving us the option of leaving one mob out grazing into August if required.
8. The balance of the MA cows (80) were on the platform until 18th June when they moved next door to the runoff (due to limited winter growth on the milking platform)
9. BCS done at the end of May recorded an average BCS of 4.55, increasing 0.14 of a condition score from 2 weeks before. 328 cows (72.8%) were either 4 or 4.5 BCS, giving a very narrow range. Of the remainder, 4 were below BCS 4 and 78 are BCS 5 or greater.

Growing Conditions

10. 9 am average soil temperature for the week was 3.6 degrees (1.4 degrees lower than 2 weeks earlier).





SIDDC South Island Dairying
Development Centre

Partners Networking To Advance South Island Dairying



Lincoln University
Te Whare Wānanga o Aotearoa
UNIVERSITY OF LINCOLN



DairyNZ



Ravensdown



LIC



Plant & Food
RESEARCH
KAWHARAU AHURAKA KŌI

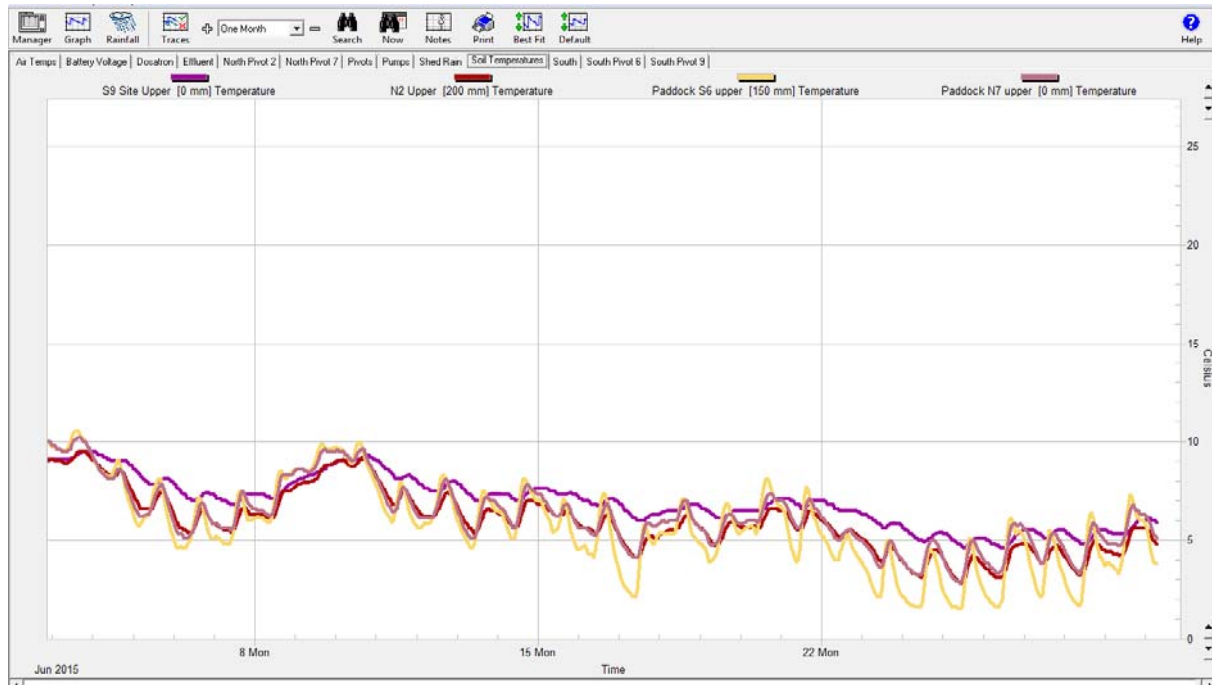


agresearch



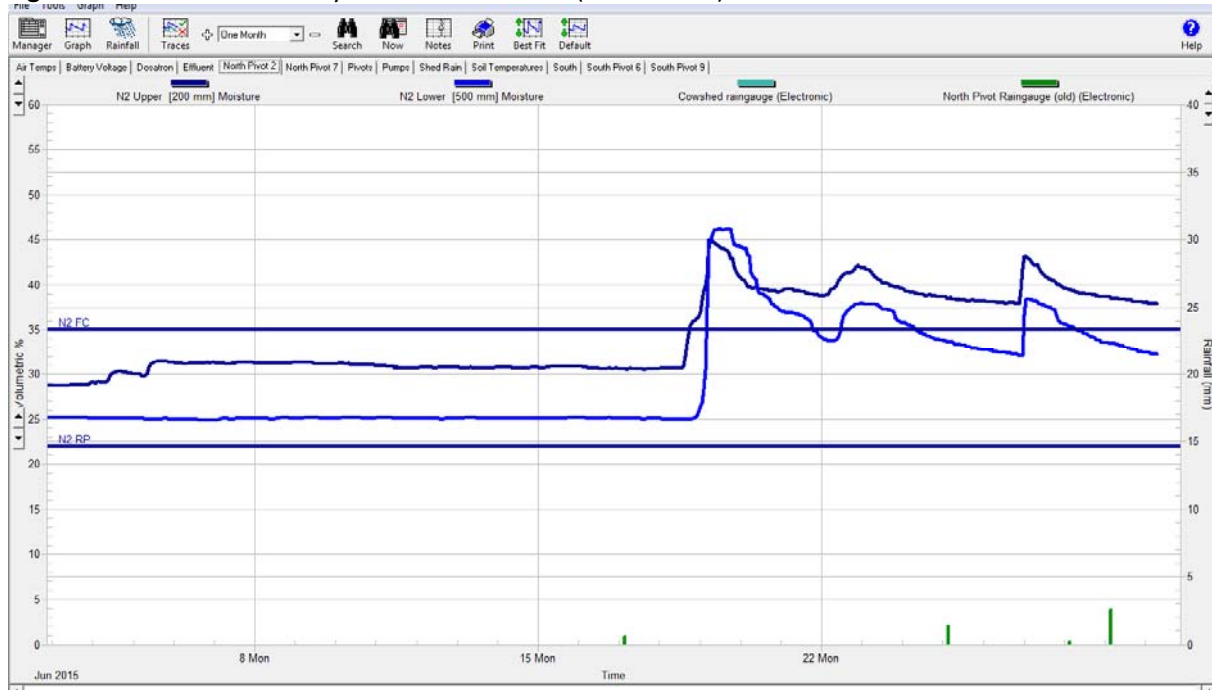
SIDE
South Island Dairying
Development Centre

Figure 1: Soil temperature history for the last 4 weeks



11. We have had 49.2 mills of rain over the last 2 weeks.

Figure 2: Soil moisture history for the last 4 weeks (Paddock N2).



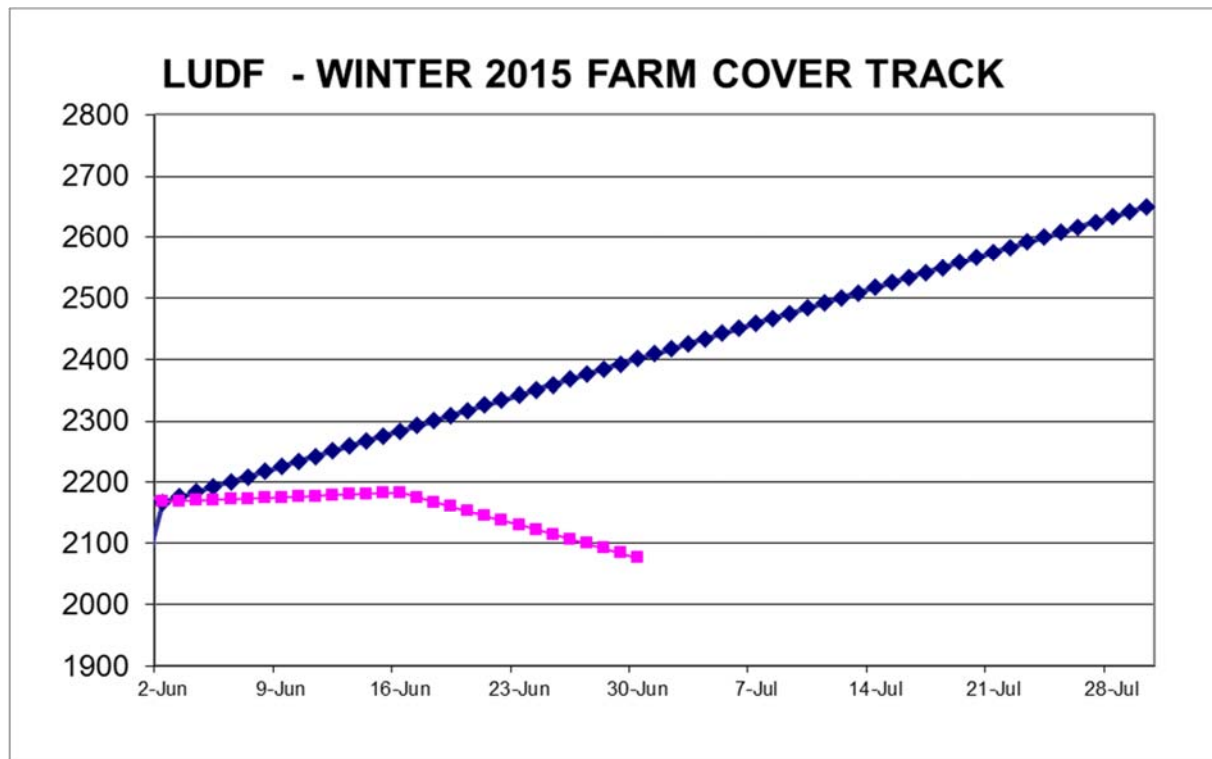
Pasture Management

12. Area grazed this week was 1.82 Ha giving a 615 day round across 160 ha
13. The post-grazing residuals are now typically plating at about 1500 kgDM/ha.
14. Our current stocking rate is 0.15 cows/ha
15. Our demand line this week is not calculated based on current demand but according to the target average pasture cover tracker for winter. This targets an APC of 2401kgDM/ha at the 30th of June. Using this APC and target residual of 1550kgDM/ha allows the pregraze target to be calculated as follows. Pregraze cover = (APC minus residual) x2 + residual or $(2401 - 1550) \times 2 + 1550 = 3252$ kgDM/ha. This provides a better understanding of where the farm is in terms of cover compared to where we had budgeted to be.

Figure 3: This week's feed wedge:



Figure 4: Autumn – Winter Target APC:



Feeding Management for the coming week

16. Estimated pasture growth over the last 2 weeks, based on the pasture cover as plated is 1 kgDM/ha/day, There has only been 6 paddocks that have had a positive growth over the last 2 weeks the other 15 paddocks have lost cover
17. Current demand for cows on farm is 1.8 kgDM/ha/day plus we need to accumulate 17.4 Kg DM /ha/day to allow APC to lift from current 2076 kgDM/ha to the target of 2650kgDM/ha by 30th July (31 days). This gives a total demand of 19.2kgDM grown per ha per day over the winter period.
18. The feed wedge estimates a feed deficit of about 50.5 tonnes (effectively the difference between target APC and current APC). To reach the target APC at calving, we therefore have to reduce demand on the farm.
19. Given the above, the management for the next 2 weeks will be:
 - a. The 24 cows will be staying on farm for another 4 days and then they will be removed. These will be offered 12 Kg DM cow a day. They will finish there current break in N1 and then move to S6 to eat a 0.8 ha break that was left when the other 80 cows were moved off farm due to wet ground conditions 2 weeks ago.
 - b. An average growth rate of 17.4kgDM/ha/day is therefore required for the next 31 days to achieve target cover at the start of calving.

Data sheet

LUDF Weekly report	31-May-15	9-Jun-15	16-Jun-15	23-Jun-15	30-Jun-15
Farm grazing ha (available to milkers)	160	160	160	160	160
Dry Cows on farm / East blk /Jackies/other	329/0/0/122	104/0/0/4 74	104/0/0/ 474	24/0/80/ 474	24/0/80 474
Culls (Includes culls put down & empties)	0	0	0	0	0
Culls total to date	137	0	0	0	0
Deaths (Includes cows put down)	0	0	0	0	0
Deaths total to date	7	0	0	0	0
Calved Cows available (Peak Number 560)	0	0	0	0	0
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)	57	0	0	0	0
Bulk milk SCC (tgt Avg below 150)	0	0	0	0	0
Lame new cases	0	0	0	0	0
Lame ytd	165	0	0	0	0
Lame days YTD (Tgt below 1000 yr end)	1891	0	0	0	0
Other/Colostrum	0	0	0	0	0
Milking twice a day into vat	326	0	0	0	0
Milking once a day into vat	0	0	0	0	0
Small herd	0	0	0	0	0
Main Herd	326	0	0	0	0
MS/cow/day (Actual kg / Cows into vat only)	1.31	0.00	0.00	0.00	0.00
MS/cow to date (total kgs / Peak Cows	498	0	0	0	0
MS/ha/day (total kgs / ha used)	0.67	0.0	0.0	0.0	0.0
Herd Average Cond'n Score	4.55	0.00	0.00	0.00	0.00
Monitor group LW kg WOW early MA calvers	0	0	0	0	0
Soil Temp Avg Aquaflex	5.4	6.8	6.4	5.0	3.6



Partners Networking To Advance South Island Dairying









Growth Rate (kgDM/ha/day)	15	0	14	0	1
Plate meter height - ave half-cms	11.9	0.0	12.0	0.0	11.3
Ave Pasture Cover (x140 + 500)	2168	0	2183	0	2076
Surplus/[deficit] on feed wedge- tonnes	0	0	[14.7]	0	[50.5]
Pre Grazing cover (ave for week)	3182	2900	3000	3020	3050
Post Grazing cover (ave for week)	1550	1500	1500	1500	1500
Highest pregrazing cover	3200	2900	3000	3020	3050
Area grazed / day (ave for week)	1.76	1.14	1.06	0.09	0.26
Grazing Interval	91	140	151	1778	615
Milkers Offered/grazed kg DM pasture	0.0	0.0	0.0	0.0	0.0
Estimated intake pasture MJME	0	0	0	0	0
Milkers offered kg DM Grass silage	0	0	0	0	0
Silage MJME/cow offered	0	0	0	0	0
Estimated intake Silage MJME	0	0	0	0	0
Estimated total intake MJME	0	0	0	0	0
Target MJME Offered/eaten (includes 6% waste)	0	0	0	0	0
Pasture ME (pre grazing sample)	0.0	0.0	0.0	0.0	0.0
Pasture % Protein	0.0	0.0	0.0	0.0	0.0
Pasture % DM - Concern below 16%	0.0	0.0	0.0	0.0	0.0
Pasture % NDF Concern < 33	0.0	0.0	0.0	0.0	0.0
Mowed pre or post grazing YTD	251.8	0	0		
Total area mowed YTD	266.2	0	0		
Supplements fed to date kg per cow (560 peak)	341.9	0.0	0.0	0.0	0.0
Supplements Made Kg DM / ha cumulative	139.4	0	0	0	0
Units N applied/ha and % of farm	0	0	0	0	0
Kgs N to Date (whole farm)	143	0	0	0	0
Rainfall (mm)	0	21	8.9	39.8	9.4
Aquaflex topsoil rel. to fill point target 60 - 80%	60-80	60-80	60-80	100-100	90-100




SIDDC South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying









Farm walks over the winter period will occur every 2nd Tuesday morning (30/6 and 14/7) then weekly. Farmers or their managers and staff are always welcome to walk with us. Please call to notify us of your intention and bring your plate meter and gumboots. Phone SIDDC – 03 423 0022.

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



 **SIDDC** South Island Dairying Development Centre

Partners Networking To Advance South Island Dairying

 **Lincoln University**
Te Whare Wānanga o Aotearoa
UNIVERSITY OF LINCOLN
New Zealand's specialist land-based university

 **DairyNZ**

 **Ravensdown**

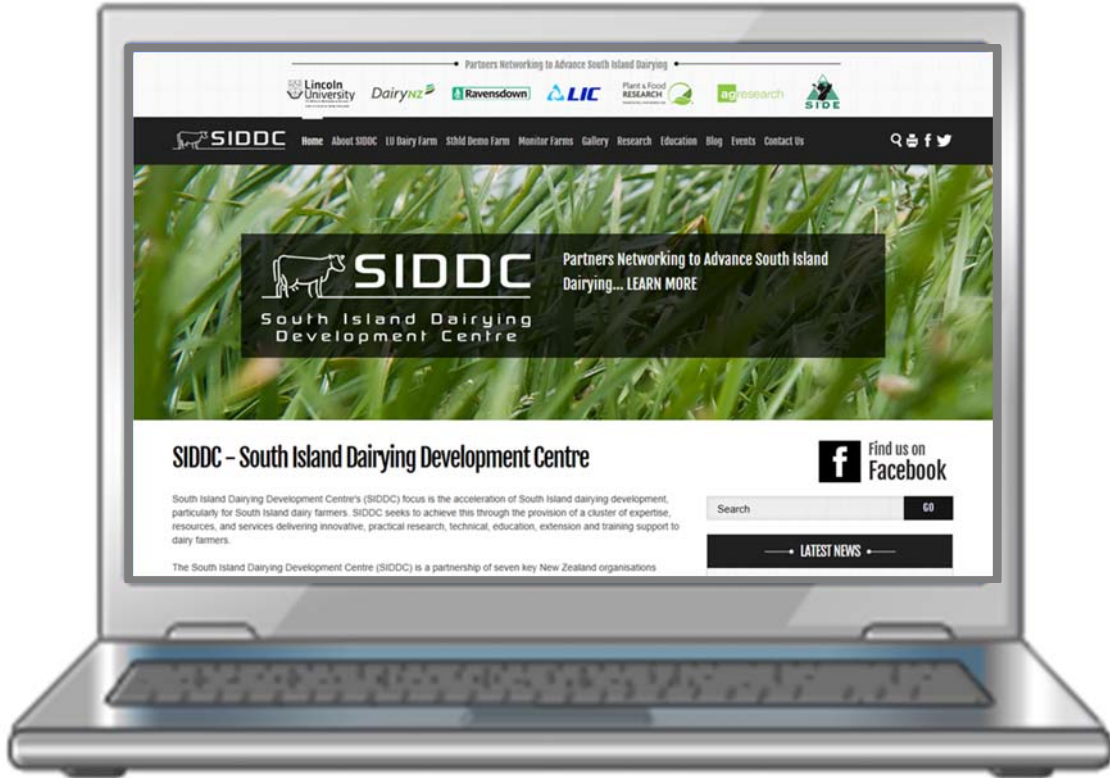
 **LIC**

 **Plant & Food RESEARCH**
KAWHARAU AHURAKA KŌI

 **agresearch**

 **SIDE**
South Island Dairying Centre

www.siddc.org.nz



Follow our Farm walk notes and up coming events by 'Liking' us on Facebook
<https://www.facebook.com/LUDairyFarm>

