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

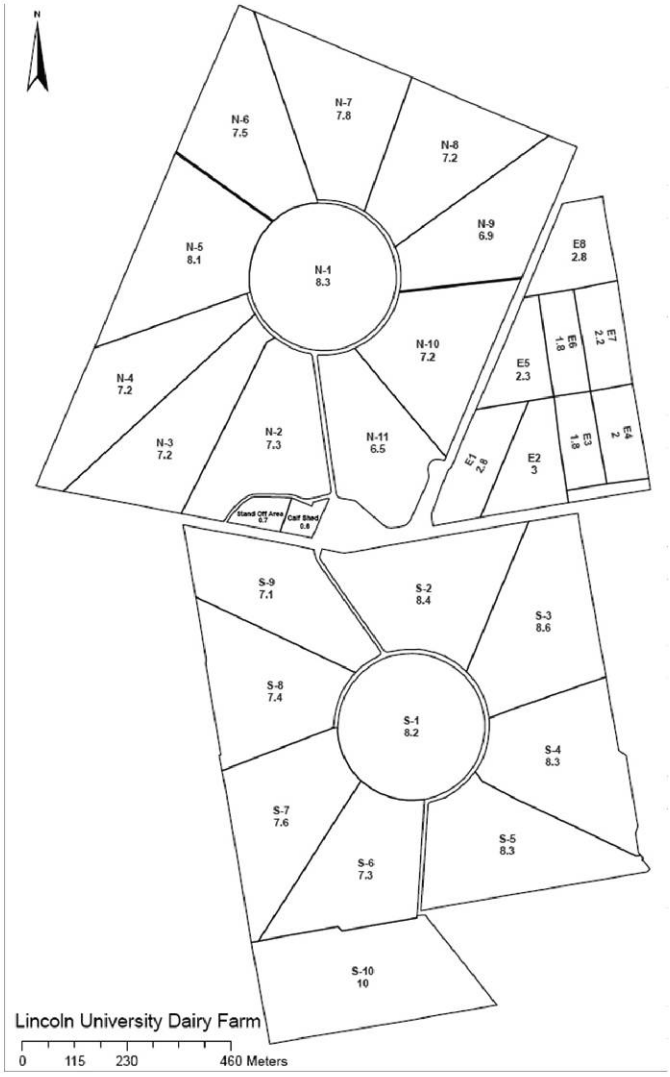
Plant & Food RESEARCH
RANGAHAU AHUMĀRA KAI

agresearch

SIDE

Phone: +64 3 325 3629
Fax: +64 3 325 3603
Email: office@siddc.org.nz
www.siddc.org.nz

Lincoln University Dairy Farm Focus Day – 1 July 2010



Staff

Peter Hancox – Farm Manager Andre Scholtz – Herd Manager
Brad Turner – Farm Assistant Kenny Oluboyede – Farm 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

Contents

LUDF Seasonal Update July 2010

Seasonal comment

We began the season expecting a milk payout less than $5.00. This had a significant effect on planning for the season just completed. We planned to have the same number of cows but spend less on feed, mating, health and everything else wherever possible. The theme was "Tight Management for Tight Times".

Winter 09

Our detailed work (explained in the July Focus day notes 2009) to achieve very even condition across the herd was successful. The herd calved in very even condition and comfortably at CS 5. The R2's being the only disappointment in that they were 30kg below their target liveweight in spite of being close to 5.5 CS at calving.

Spring 09

It has been a very good season for milk production. Early spring 2009 was very warm and delightfully dry. Man and beast had a great calving. The herd was milked once a day for the first 21 days of the season. LUDF enjoyed the highest milksolids/ha peak ever. This was a result of a very tight calving pattern and a high number (192) of R2's in the herd.

Cow body condition at the start of mating was at least 0.25 ahead of the previous season. The number of cows cycling combined with a desire to spend less money on mating gave the team confidence to not use any CIDR devices.

Mating

(Results detailed in the May Focus Day notes) achieved 74% recorded as in calf at 6 weeks and 87% of the herd IC at 10 weeks. Mating 10 weeks only.

Summer

Conditions suited most of Canterbury. January was 2^{o}C cooler than average with a lot of grey days. This suited mid plains farms but LUDF in the path of cloudy North easterlies grew less pasture than average and we found ourselves needing to feed silage to avoid grazing to very low residuals or to break into once a day milking for a period.

Mastitis was much more easily managed this season with a total of 101 infections against 182 last year. Reducing infections at calving being the easily identifiable difference. (May Focus day notes)

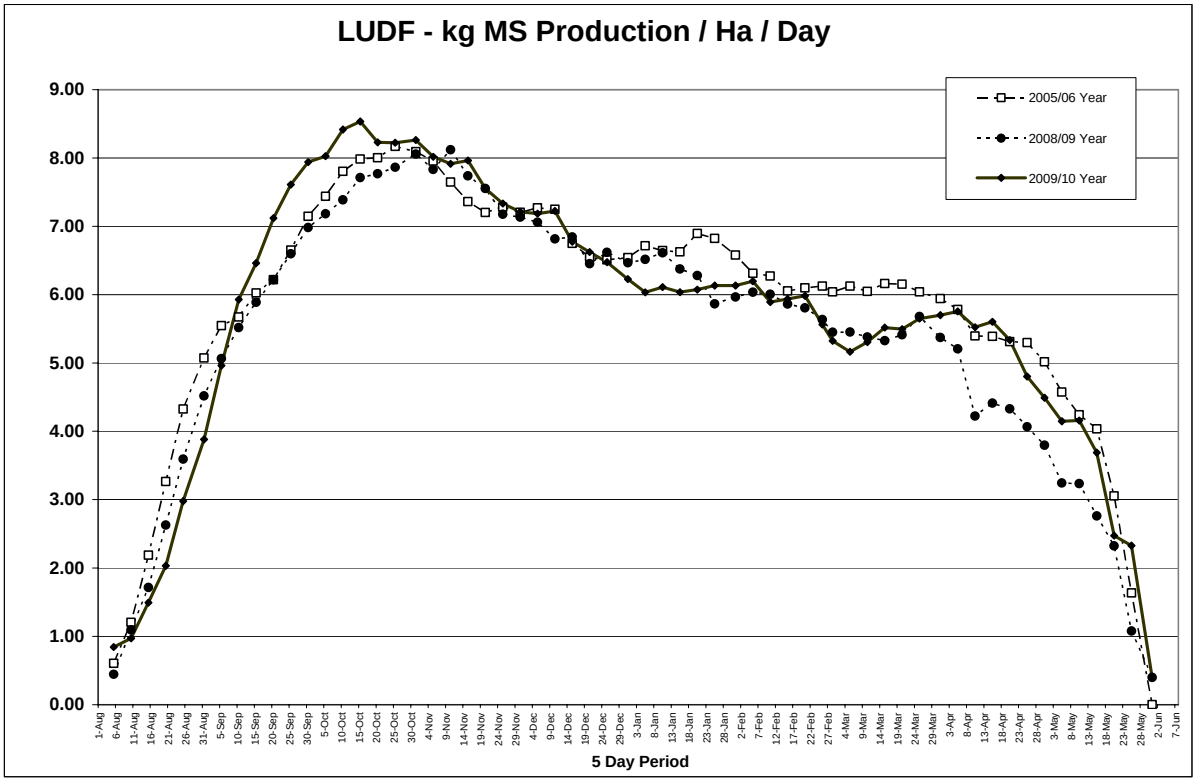
In spite of an easier spring and good farming conditions across the season lameness increased compared to the previous season and the farm has never been better than average in comparative studies. Discussed in detail in May with the result that three changes will be made to the physical environment. The south block lane will be recapped with lime rock from Geraldine, the south entrance to the yard changed to facilitate smoother cow flow and the top-gate will be setup to come forward at a slower speed.

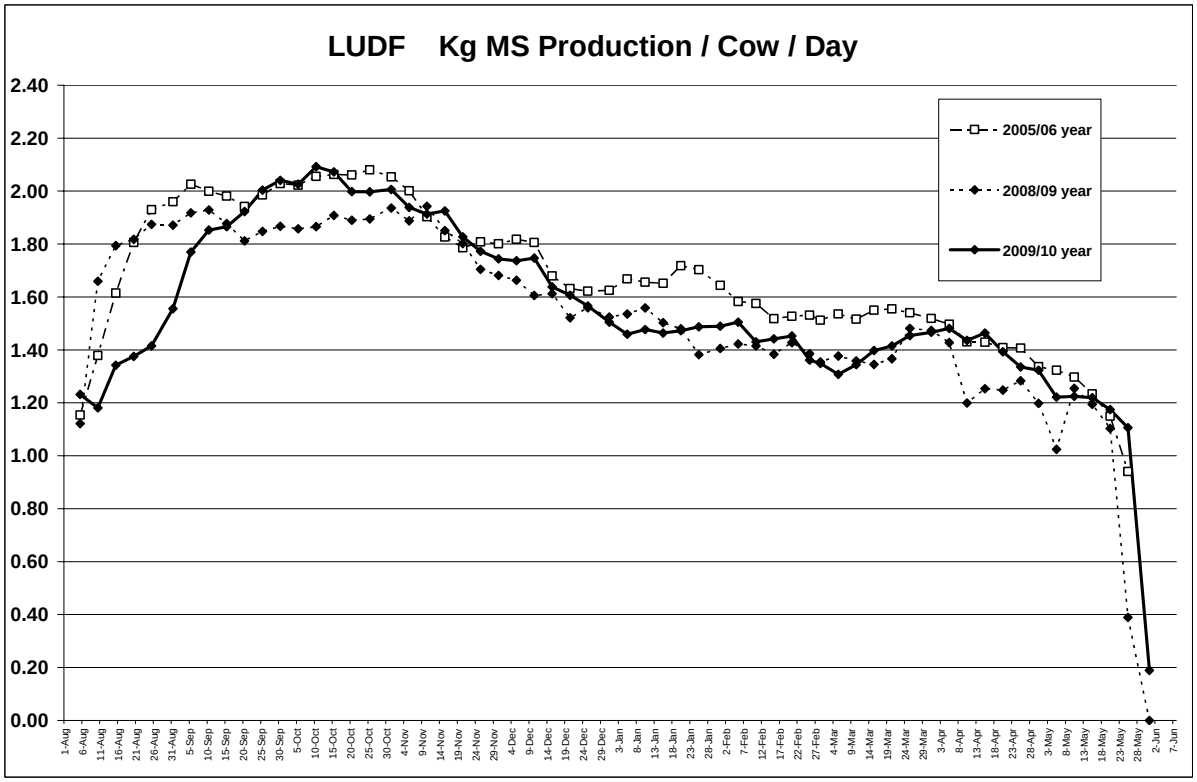
In response to increased milk price and feed being available at less than 5% of that price, an additional 40 tonne DM baleage (60kgDM/peak cow) was purchased and fed during April and May. Season total 260kg purchased DM/cow. This silage, along with retaining better body condition during the season, meant that once a day milking was not required at the end of the season to try and conserve or gain condition while continuing to milk the herd.

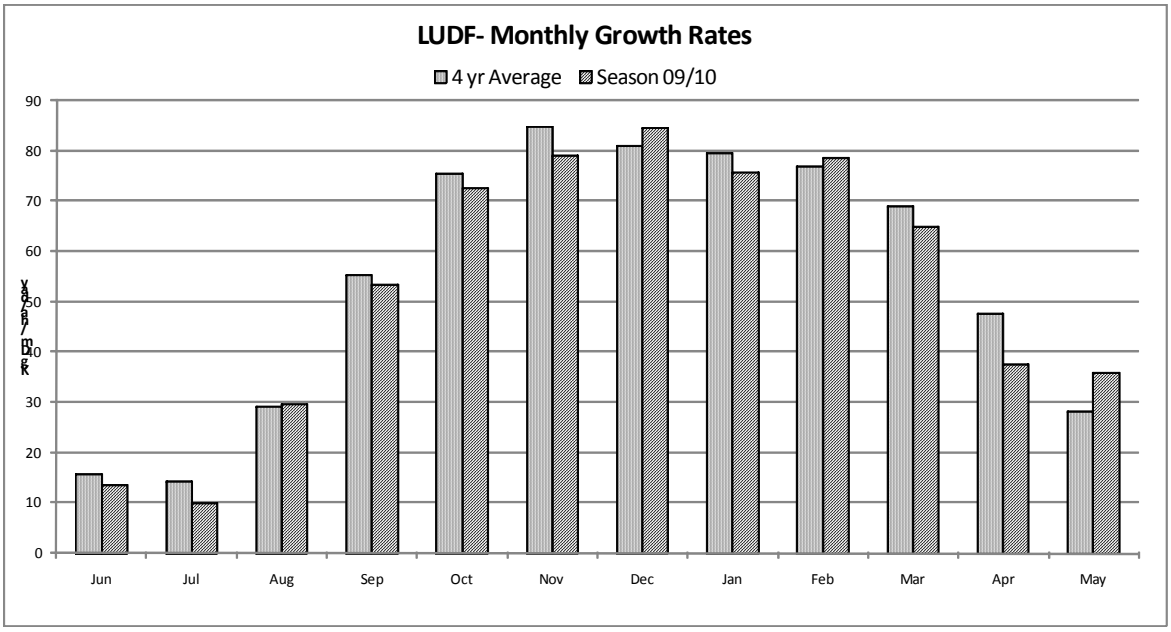
We have also noted that liveweight gain is more reliably occurring when we are feeding silage in the autumn.

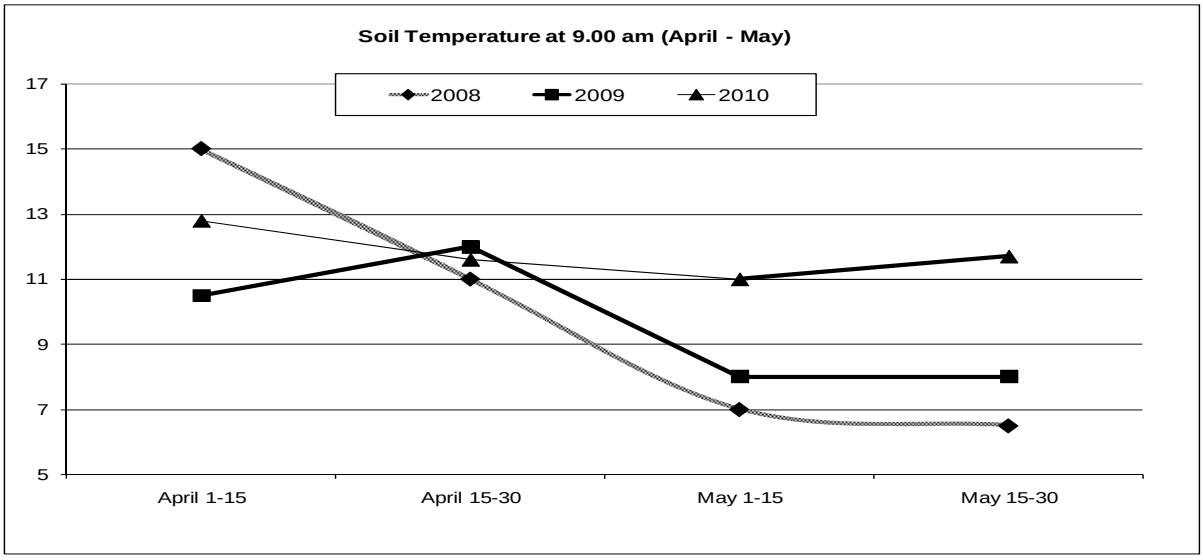
Seasonal feed production

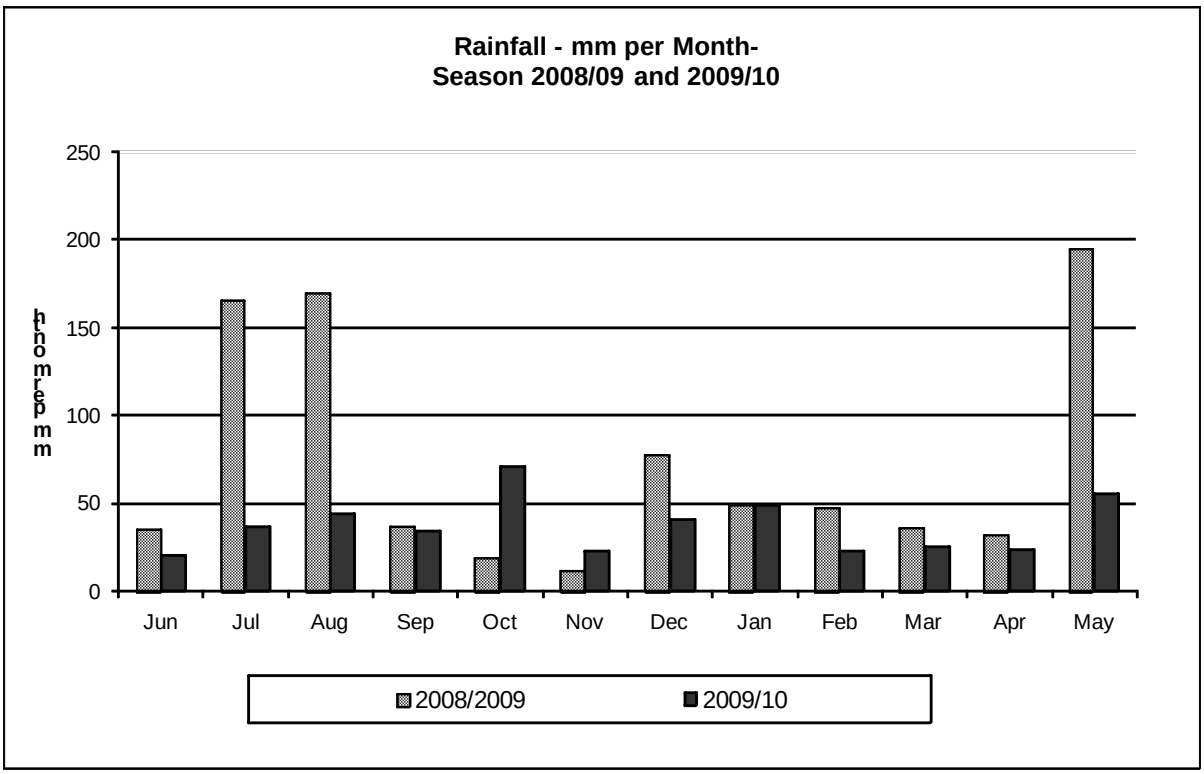
May was a better month but in 8 months of the year pasture growth was assessed to below the 4 year average.

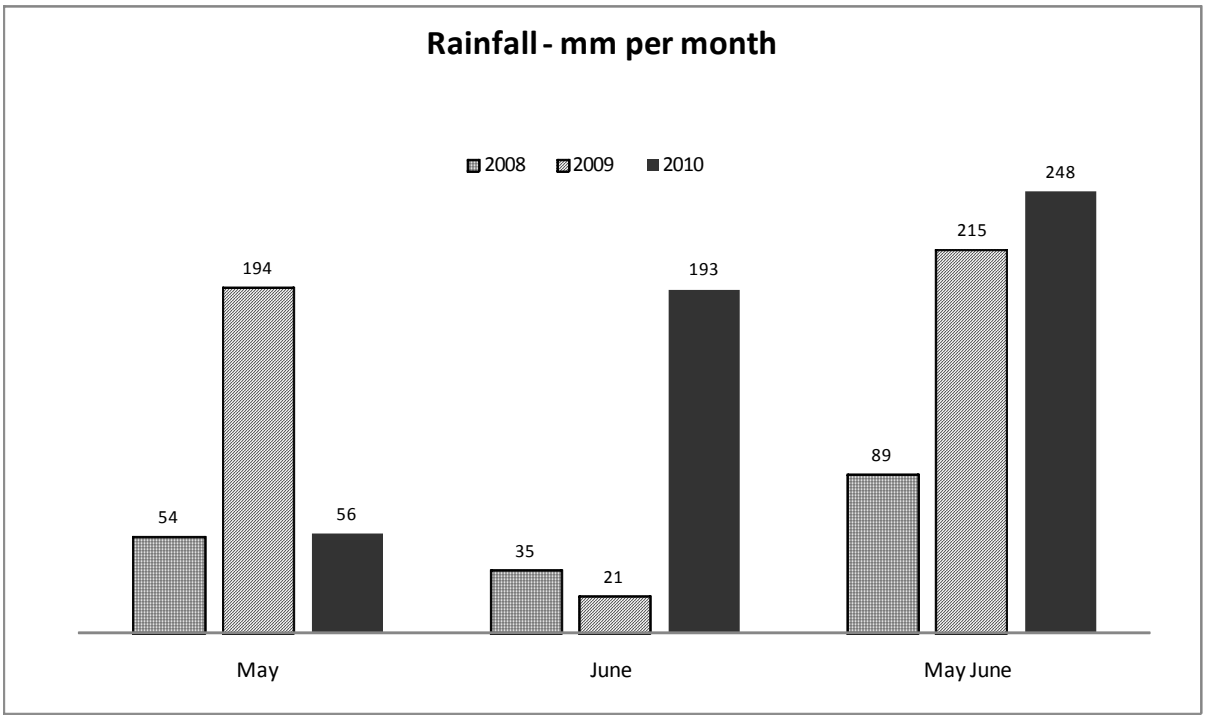


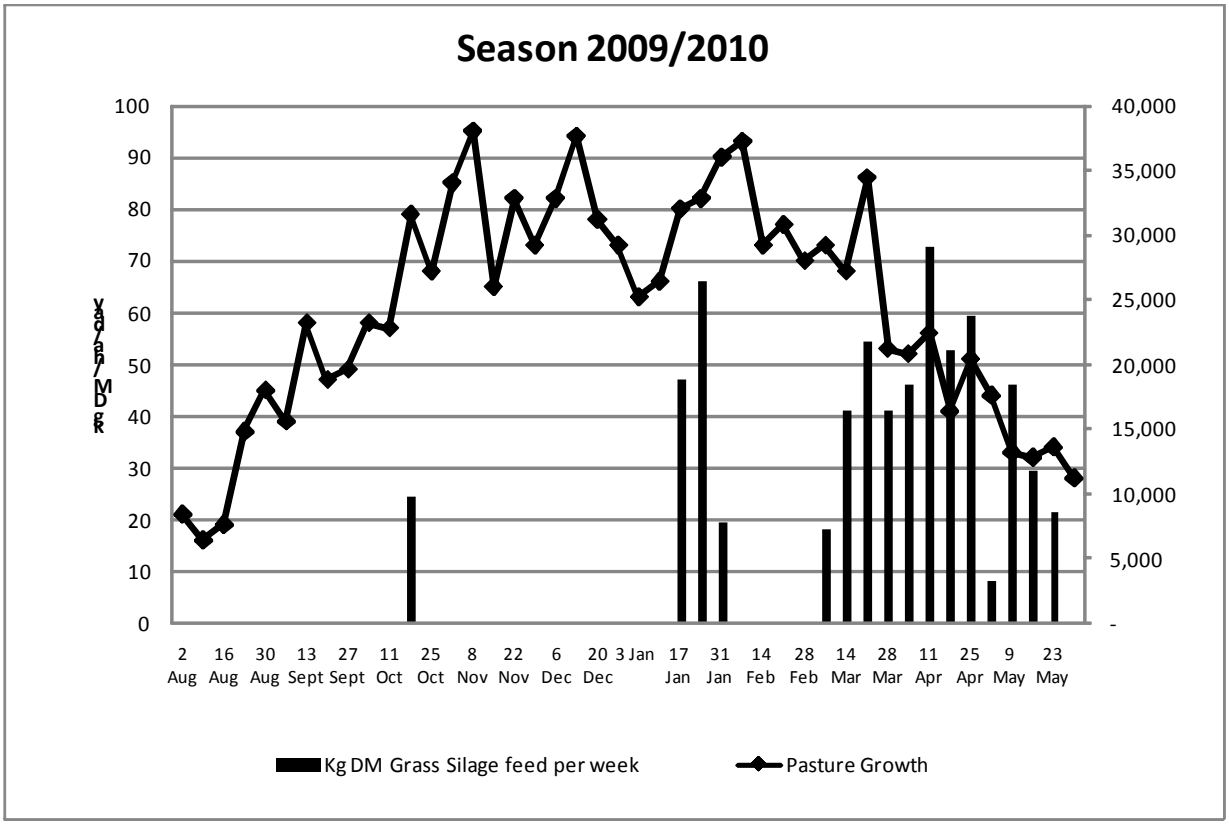


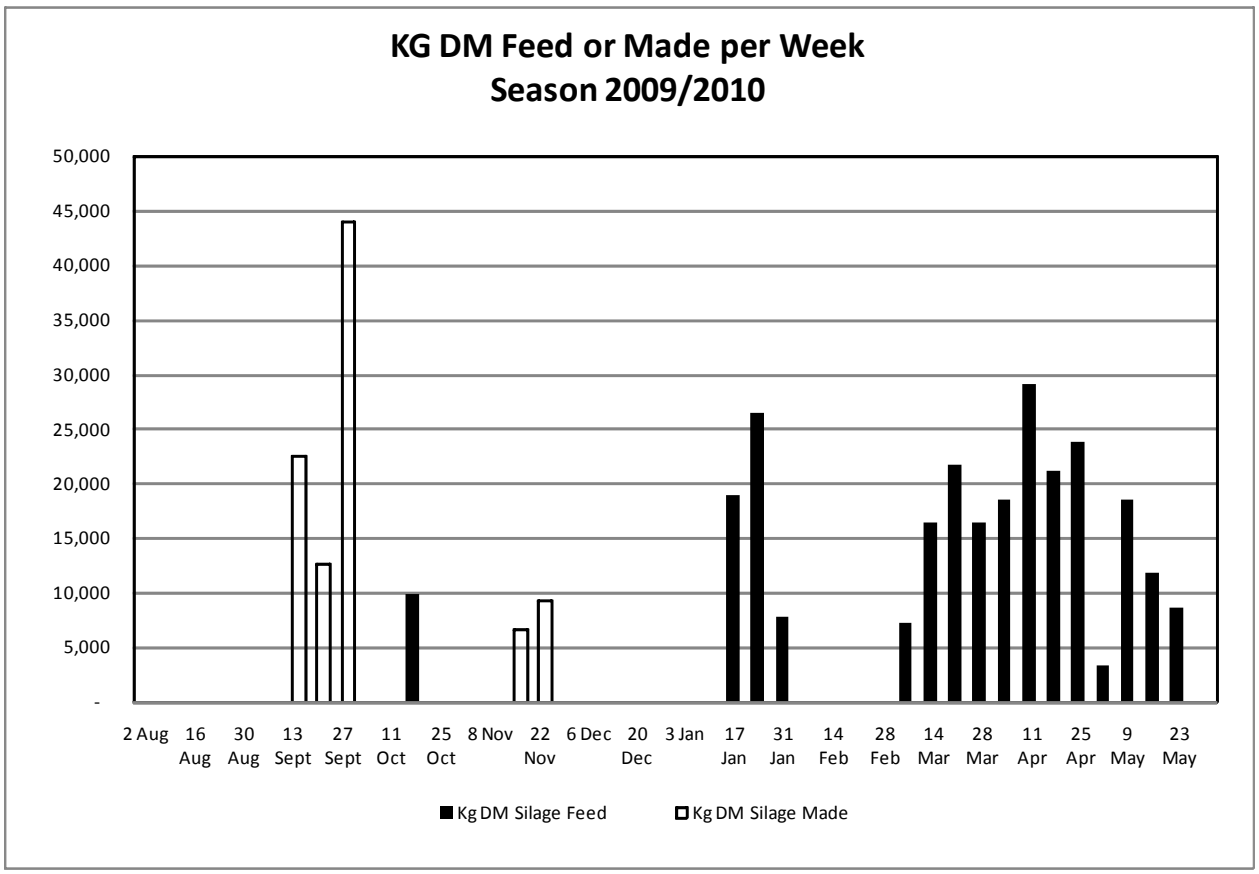





Rainfall - mm per Month-
Season 2008/09 and 2009/10
250
200
150
100
50
0
mm
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
2008/2009
2009/10


Rainfall - mm per month
2008
2009
2010
54
194
56
35
21
193
89
215
248
May
June
May June





Additional spending

The tight spending budget was overall adhered to but there were three notable additions during the season when we had confidence in regard to a higher milk price i.e.

- an additional paddock was re-grassed
- additional feed was purchased to support milk production in the autumn. 40t DM
- decision to vaccinate the herd for BVD was taken before a milk price change was indicated.

Drying off

This was completed by the 26th of May, the day we had planned early in May. By that date the milking herd was down to 335 because we dried off 200 of the lighter (4.25 – 4.4) conditioned cows in mid May based on condition and expected feed available.

The farm was very wet during the last 12 days of May (same amount as last year). As a result of holding cows off pasture and using the East block, average pasture cover was 2280gDM/ha - above the targeted 2050kgDM/ha at June 1st.

Wintering plan

The principles we follow while making the plan are aimed at having all cows at (BCS) 5.0 by their calving date and to have the work required for the farm staff to be manageable in a way that allows time to catch up on maintenance and introduce any new staff thoroughly to the systems and procedures at LUDF.

Principles

1. The cows most at risk will be fed pasture to 7 clicks. They will be moved when they achieve that residual. Hopefully they will eat 11 - 12kg DM/day and rapidly gain body condition.
2. R2's grazed on pasture if possible.
3. The use of kale to be reserved for mid aged cows already in reasonable condition and, if possible, have a runoff with some fresh pasture available each day. The other support feed to be higher quality than straw.
4. Cows separated by calving date and condition within that grouping if necessary.
5. Herd sizes around 200 cows or less

The wintering herds

1. **110 early calving cows in lighter condition** were grazed on the platform during June, they have gained condition rapidly and will continue on the platform grazing to 7 clicks.
2. **125 August calving cows** have been grazing pasture at our neighbours and are currently on kale near Springston. They also have added significant body condition during June and are a pleasure to look at. They average 5.0 BCS with less than 20% below score 5.0.
3. **192 cows with late August and September calving dates**, were trucked to Hororata to kale on the 30th of May, supported with nearly half a diet of very good (11.0MJME/kgDM and 13.5% Crude Protein) cereal silage. This was purchased when we were searching for some suitable grass silage to put in a stack near the kale last Christmas – when it was a buyers market. We were searching for higher quality feed than straw based on better understanding of the cows diet needs following the work and reports this time last year by both Prof Grant Edwards and Dr Jim Gibbs. The cows have responded very well to this diet. The plan for these cows is not to return to the platform until the 15th of August.
4. **96 second calvers** are on annual ryegrass at a farm near Dunsandel. They have gained condition and size very well so far this winter. It would be great to achieve 5.5 BCS for these.
5. **The 164 R2's** have been grazing pasture and will continue with a pasture diet in two locations. They were brought home early this week for Teat Seal to be infused into each quarter. They are very well grown and are in excellent condition. They will return to grazing close to the Platform on July 20th.

Staff

Peter Hancox, Farm Manager, is enjoying some very well earned rest and returns to the LUDF in a few days. The team are directly managing the 110 cows at home, the 125 cows at Springston and the 164 rising 2's also in the Springston district. This, along with a manageable farm maintenance load, is leading to an easier winter than some previously encountered at LUDF.

The team from last season is continuing on into next season. We are very happy with this situation and attribute a better current retention to the considerable effort made recruiting around compatibility and potential longevity. We also put significant effort into induction. That in itself is not new but we have also been conducting reviews with each staff member much more regularly. Sarah Watson from DairyNZ has been assisting with this process.

Things we have learnt this season - 2009 - 2010

1. Bulls - trusting that well grown Jersey bulls that appear in all ways to be well and mating normally is not enough. We had less than acceptable MT results in R2's and bull mating in the herd. R2's 14% MT, cows bull mating period was also disappointing.

   Response
   We will own the bulls much earlier, they will be vet checked for ability to mate, blood tested and then vaccinated for BVD at least 5 weeks before they are needed for work.

2. Lameness - If the equipment is not adequate training staff can mitigate the issues causing lameness to an extent but issues with the top gate in the cow yard at LUDF in need to be dealt with. Lameness in the LUDF herd has never been below average for survey farms. This season in particular lameness was very expensive. 128 cases against an acceptable level of no more than 66 (10%).

   Response
   Healthy Hoof training and recording will be continued with the team but also the top gate will be altered to greatly reduce its forward speed. The southern entrance to the cow yard can also be altered reasonably simply making it easier for cows to enter the yard. Visibility of the backing gate at cups on and ways to prevent it ever being used to push cows are also being explored.

3. Budget - it was possible to reduce running cost by 10% this season when compared to 2008/09 - not quite sustainably given the long term goals for the farm. The 2010 – 2011 budget for the farm remains 5.4% below 2008 - 09 spending.

4. Grazier - a good result with a grazier one year may not translate to the next. Monitoring of the R2's that calved spring 09 was apparently not adequate given they entered the herd about 30kg below target liveweight.

   Response
   Monitor all off farm animals including regular weights monthly. Always.

5. Winter feeding - monitoring of winter feeding and cow care even with experienced graziers makes a difference.

6. BVD - If you test for this disease a response plan is needed. We found ourselves making a long term decision in a very short timeframe. If vaccination is a possible response the timing of the tests needs to take account of this. If vaccination or further testing to locate persistently infected animals is not likely to be an option we are not sure why testing would be done.

7. Peter can have a break.

8. Teatseal - the research results for teatseal are reliable and for the mastitis situation at LUDF the application of Teatseal to first calvers and mature cows is very profitable. This result is written up in the Focus day notes for May 2010.

	04/05	05/06	06/07	07/08	08/09	09/10
Teat seal treated					1st calvers	1st calvers & half MA cows
Cow milking days lost	639	723	1845	1550	1680	903
Avg MS lost/day	1.5	1.5	1.5	1.5	1.5	1.5
Total MS lost	959	1085	2781	2325	2520	1355

9. In volatile times it is smart to set the farm plan for the season to use the pasture that will be grown. Further cost reduction in last season's budget was likely to reduce capacity of the farm in that or subsequent seasons.

Overall feed supply and Supplementary feeding

10. Maize or other fine chop silage fed on the ground at LUDF leads to high wasteage as soon as there is 25mm of rain. A small volume of maize silage was fed in late April quickly reminding us of this fact.

Response

Unchopped pasture baleage remains the feed of choice for LUDF

Feed Cost Calculator – Weights and prices

											Consumed	
	Weight	Cost	Cents/ kgDM	DM %	ME	M/D	Cents/kg PEDM	Cents /MJME	Cents /kgDM	Waste%	Cents/kg PEDM	Cents /MJME
Nitrogen boosted grass kg DM/kg N	10 kgDM	$1.45/kgN	14.50	100	12	1.09	**13.29**	**1.21**	14.50	0	13.29	**1.21**
Pasture Baleage	235 kgDM	$71.00	30.21	100	11.3	1.03	**29.41**	**2.67**	30.21	10	32.68	**2.97**
PKE	1000 kg	$260.00	29.21	89	11	1.00	**29.21**	**2.66**	29.21	20	39.52	**3.59**
Cereal – Rolled	1000 kg	$310.00	**36.05**	86	12.5	1.14	**31.72**	**2.88**	36.05	1.0	**32.04**	**2.91**

11. There is scope to strategically use more fertiliser nitrogen given the farms current use of nitrogen, potential yield, use of eco-n, and extensive on farm monitoring of drainage water. 185kg fertiliser N was used over the whole platform 2009 –2010 season.

Response

If total N is raised to 245 kgN/ha over the whole platform the additional N at a conservative response rate of 10kg DM/kg N will generate 600kg pasture/ha or 95,000 kg DM on the whole farm. Pasture in the LUDF system is typically converted to milk at 11kgDM/kg milksolids. Adding 60kgN/ha will cost approximately $13,800 and should add 8,600kg milksolids (giving over $50,000 gross return).

The dairy effluent has until this season been spread over 28ha of the North Block. The additional effluent sprinkler system has added another 26ha that is able to receive effluent. This is allows a better use of the effluent nutrients but also potentially leaves some of the area significantly nitrogen responsive at times.

Previously	Non-Effluent Area	Effluent Area	Total Milking Platform
Area	131 ha	28 ha	159 ha
Form of N	Fertiliser	Effluent	
Total Fertiliser N	225 kgN/ha	0kgN/ha	185 kg N/ha
Proposed 2010-11	105 ha	54 ha	
Fertiliser N	Up to 300kg/ha	140	245 kg N/ha

Typical N Applications – LUDF

Timing		Typical Application to date	Proposed* (as required)
Mid August (Soil Temp dependent)		40 kg N	40 kg N
End of 1st Round - 10 Sept			25 kg N
Every 21 days – following the herd	1 Oct	25 kg N	25 kg N
	22 Oct	20 kg N	20 kg N
	12 Oct	20 kg N	20 kg N
	12 Nov	20 kg N	20 kg N
	3 Dec		20 kg N
Miss a round late December	24 Dec		0 Kg N
Every 21 days – following the herd	14 Jan		20 kg N
	4 Feb		20 kg N
Round extended to 30 days from late February	25 Feb	40 kg N	40 kg N
	27 Mar	30 kg N	40 kg N
	26 Apr	30 kg N	30 kg N
Season Total		**225 kg N**	**300 kg N**

* Proposed N Applications – will be used as required BUT restricted to use as per best practice, ie applied when conditions are suitable for pasture growth, when the pasture is N limited and therefore responsive to N, when an economic yield response is expected from additional N and when the farm is expected to be able to graze (effectively utilise) the additional feed produced. Use in these conditions is premised on the expectation the applied N will be taken up by the plants.

The LUDF management and advisory teams have looked at some other systems – in particular systems using grain and PKE

The DairyNZ part of our team have gathered detailed information and used Dairybase to help analyse a number of high performing farms. See Farm System Review

LUDF Response

Local grain for on farm rolling has been cheaper per MJME eaten than pasture silage during the last 2 seasons. We are very aware of the potential for genuine supplementation with grain but are also aware that the relationship of purchased supplement and milk price needs to be less than 5%. If using the long term forecast milk price of $5.40/kgMS we require feed at less than $270/tonne.

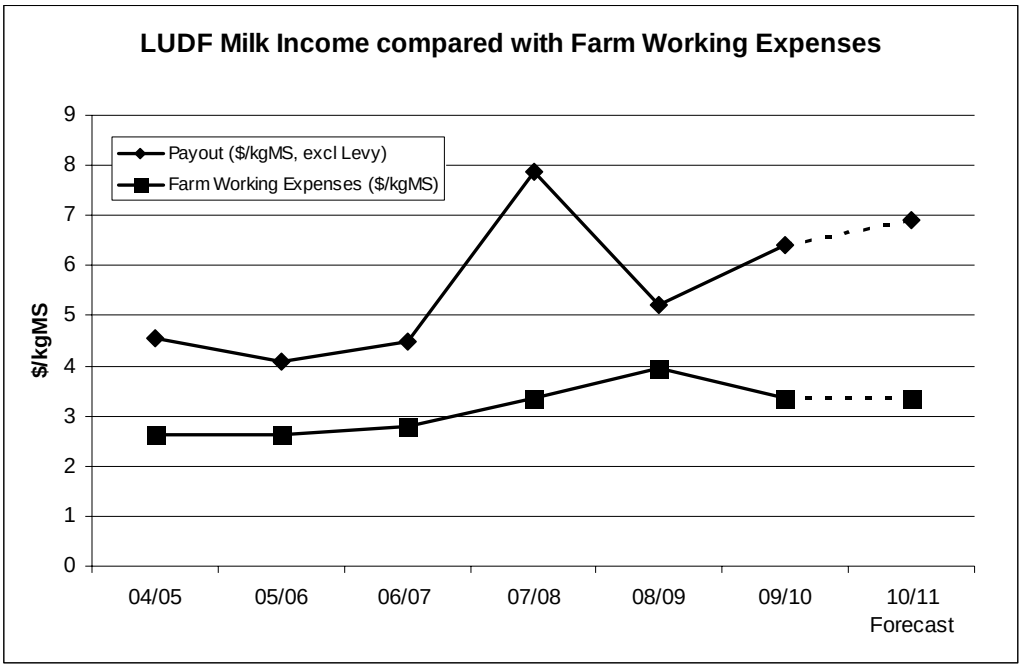
There have been, what we believe to be relatively short term, very profitable opportunities for farmers who have been able to both graze pasture very well and purchase low priced grain. Well irrigated farms with good pasture and using identical grazing strategies to LUDF have been able to achieve higher per cow production than the LUDF, and therefore cover overhead costs such as grazing, replacement costs, staffing and so on more effectively.

Unlike a large number of farms in Canterbury, LUDF does not have in-shed feeding facilities to make use of this current opportunity with low price grain. With hindsight the infra-structure could possibly have been paid off within this period of low priced grain and above average milk prices. We remain unconvinced of the economics of investing in the necessary infrastructure at this point in time.

PKE for a period was also more profitable than pasture silage. PKE may return to that situation but 5% of the announced milksolids value for next season of $6.60 is 33 cents. The example calculated on the previous page shows the consumed price of PKE at the current price to be 39 cents.

For LUDF, we believe using additional Nitrogen fertiliser and purchasing some additional pasture baleage should enable the existing herd [and stocking rate] to increase days in milk and avoid a summer feed pinch thus positioning LUDF profitably relative to other systems in Canterbury.

LUDF Budget – Notes for 2010/11 Season



Budget Summary

	2010/11 Budget	09/10 Actual	Change ($)	Change (%)
Total Income	**$2,055,562**	**$1,805,891**	**$249,671**	**14%**
Feed expenses*	$338,112	$339,737	-$1,625	0%
Herd expenses**	$203,948	$190,617	$13,331	7%
Wages	$218,276	$214,651	$3,625	2%
Shed / Electricity / Irrigation	$93,033	$100,779	-$7,747	-8%
R&M / Vehicle	$72,800	$47,545	$25,255	53%
Admin / Rates & Insurance / Other	$39,912	$33,155	$6,757	20%
Total Farm Working Expenses	**$966,082**	**$926,484**	**$39,598**	**4%**
Depreciation	$117,500	$110,000	$7,500	7%
Total Operating Expenses	**$1,083,582**	**$1,036,484**	**$47,098**	**5%**
Operating Profit	**$971,980**	**$769,407**	**$202,573**	**26%**

*Feed expenses include all costs associated with bought in Supplementary feeds, winter grazing, fertiliser, weed and pests, freight, contracting etc.

**Herd Expenses include all animal health costs, breeding expenses, replacement grazing etc

Lincoln University Dairy Farm — Budget for 2010 - 2011

Year ending May 31	159.1ha	**Budget**		**2010/11**		**Actual 09 - 10**	**Difference**	
Milk production	Milksolids		1,810/ha	287,971	274,649	1,726/ha	13,322 kgms	
Cows	Peak number &prodn	660cows	4.15/ha	436/cow	416/cow	660cows		
Staff	3.70 FTE's	178cows/FTE		77,830ms/FTE				
Income				$/kgMS	$/kgMS		$ change	
Milksolids $/kgMS	$6.60	92%	1,900,609	6.60	6.10	1,675,359	225,250	13%
Dividend	$0.33	4%	91,740	0.32	0.30	97,300	- 5,560	
Surplus dairy stock		1%	26,000	0.09	0.18	48,577	-22,577	-46%
Other stock sales		3%	58,813	0.20	0.17	45,955		
		100%	**2,077,162**	**7.21**	**6.28**	1,867,191	209,971	11%
Stock Purchases			21,600			61,300	-39,700	
Gross Farm Revenue			**2,055,562**	**12,920/ha**		**1,805,891**	**249,671**	**14%**

Expenses				**2010/11**	**2009/10**		$ change in	%
		Actual $	$/cow	$/kgMS	$/kgMS	**Actual $**	expense	change
Administration		23,650	35.8	**0.08**	**0.06**	17,291	6,359	37%
Animal Health		45,636	69.1	**0.16**	**0.18**	50,215	-4,579	-9%
Breeding Expenses		37,434	56.7	**0.13**	**0.12**	32,937	4,497	14%
Electricity-farm		18,500	28.0	**0.06**	**0.07**	18,246	254	1%
Employment		198,276	300.4	**0.69**	**0.71**	194,651	3,625	2%
Grass silage purchased	300 kgDM/cow	65,340	99.0	**0.23**	**0.23**	62,238	3,102	5%
Silage making & delivery		17,183	26.0	**0.06**	**0.04**	12,192	4,991	41%
Replacement grazing & meal		120,878	183.1	**0.42**	**0.39**	107,465	13,413	12%
Winter grazing - Herd		125,355	189.9	**0.44**	**0.52**	142,874	-17,519	-12%
Nitrogen and EcoN		78,140	118.4	**0.27**	**0.26**	71,841	6,299	9%
Fertiliser & Lime		36,355	55.1	**0.13**	**0.13**	34,968	1,387	4%
Freight & Cartage		400	0.6	**0.00**	**0.00**	58	342	590%
Irrigation - All Costs		66,333	100.5	**0.23**	**0.28**	76,573	-10,241	-13%
Rates & Insurance		16,262	24.6	**0.06**	**0.06**	15,864	398	3%
Regrassing		15,040	22.8	**0.05**	**0.06**	15,126	-86	-1%
Repairs & Maintenance		52,500	79.5	**0.18**	**0.10**	27,963	24,537	88%
Shed Expenses excld power		8,200	12.4	**0.03**	**0.02**	5,960	2,240	38%
Vehicle Expenses		20,300	30.8	**0.07**	**0.07**	19,582	718	4%
Weed & Pest		300	0.5	**0.00**	**0.00**	440	-140	-32%
Accommodation allowance	3 houses	20,000	30.3	**0.07**	**0.07**	20,000	0	
Cash Farm Working Expenses		**966,082**	**-**	**3.35**	**3.37**	**926,484**	**39,598**	**4.3%**
Depreciation est		117,500		**0.41**	**0.40**	110,000		
Total Operating Expenses		1,083,582		**3.76**	**3.77**	1,036,484		
Dairy Operating Profit		**971,980**	***1,473***	**3.38**	**2.80**	**769,407**	202,573	
DOP		**6,109/ha**				**4,836/ha**	1,273	
Cash Operating Surplus		**1,089,480**		**3.78**	**3.20**	**879,407**	**210,073**	
		6,848/ha				**5,445/ha**		

Winter Grazing Requirements	Number	Time Grazing
Cows Grazed on Dairy Farm	50	
Cows off platform during April/May	50	3.5 weeks
MA cows grazed June and July	469	8.0 weeks
R2's Grazed Off-farm Winter	164	6.0 weeks
Cows & R2's grazed 1 week August	500	1.0 weeks
Cows & R2's grazed 2nd week August	400	1.0 weeks
Cows & R2's grazed 3rd week August	300	1.0 weeks
Cows & R2's grazed 4th week August	100	1.0 weeks
Cows grazed 5th week Aug/Sept	0	1.0 weeks
Replacement Grazing		
R1's Grazing June - 31st Aug	166	13.1 weeks
R2's Grazing September - 30th April	165	34.5 weeks
R2's Grazing May	161	4.4 weeks
R1 calves December - 28th Feb	198	12.0 weeks
R1 calves March – May 31st	198	14.0 weeks

Supplementary Feed		
Kg DM Silage Made on Platform	95,460 kgDM	
Kg Silage home made/ha	600 kgDM/ha	
Kg Silage home kgDM/cow	145 kgDM/cow	
kgDM Silage purchased	198,000 kgDM	
Silage purchased off farm	300 kgDM/cow	
Total Silage cost	**$82,523**	**$125/cow**
Hay / Straw	20 kg DM/cow	
Total cost	**$2,459**	
Calf Meal		
Meal allowance per calf reared	50 kg	
Calf Meal tonnes	9.9	
	$7,924	**$40/calf**

Fertiliser Nutrients Applied	
Units Nitrogen Applied/non effluent ha	300
Units Phosphate Applied/ non effluent ha	41
Units Potassium Applied/ha non effluent ha	0
Units Sulphur Applied/ha non effluent ha	67
Units Phosphate Applied/ effluent ha	5
Units Sulphur Applied/ha effluent area	47

Plus Eco-n applied to all milking platform, late autumn immediately following grazing and late July.

Mating / Breeding costs	
CIDRs	40 cows
AB	1.5 straws per cow
Kamars	0 cows
Bull Fertility checks	16
Preg tests	2 scans
General	660 cows
Herd Testing	4 Tests
MINDA/Protrack	
Total	$37,434
Per cow	$ 56.72

Repairs and Maintenance breakdown:

South Lane - recap - winter 2010 -	$18,000
Dairy platform rollers -refurbished to minimise ongoing R&M	$10,000
Upgrade Southern entrance to dairy yard	$1500
Upgrade drive and controls for top gate	$8000

Lincoln University Dairy Farm - Farm Walk notes

Tuesday, 29th June 2010

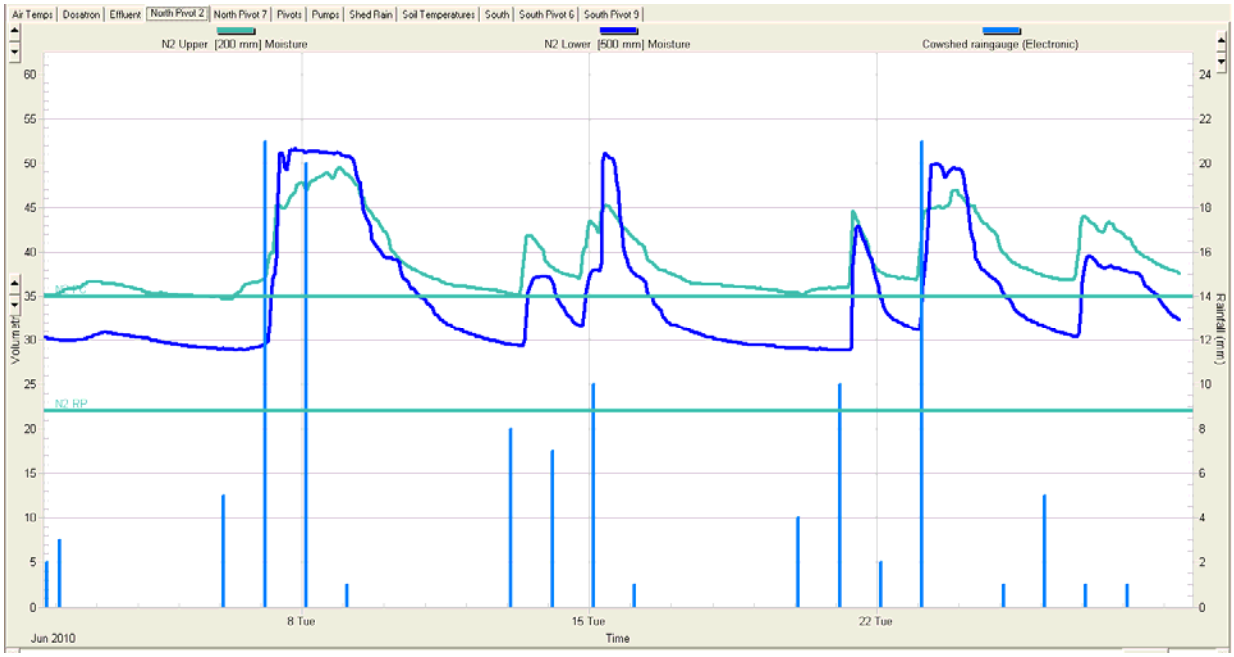
CRITICAL ISSUES FOR THE SHORT TERM

1. **Monitor condition and make necessary changes to achieve the targets**
2. **Observe feeding behaviour of cows**
3. **Closely observe cows for any signs of mastitis**
4. **Monitor average pasture cover and track against Budget**
5. **Keep grazing residuals to the desired 7 clicks on platform pastures**
6. **Avoid pasture damage by standing off if necessary**

Summary of Key Factors affecting Grazing Management & Animal Performance

7. Soil temperature this week was 6.5°C with a range of (5 °C to 7.5 °C today).

8. We had 31 mm rain over the last week with rain on 5 days. Soil moisture has been above Field Capacity again all week. When this occurs we run risk of doing damage to soils being grazed. The 110 cows on the platform have been stood off at night for two nights and completely removed to the East Block for 4 days this week because they were damaging soil and pasture. The graphic from Aquaflex below shows the extent to which the soil has been above Field capacity this June. Focus on the aqua coloured lines – the uppermost straight one of these indicates Field Capacity and the other aqua coloured line is the track of soil moisture in the topsoil. The heavy blue line represents the soil moisture in the subsoil. When this sub soil line is above the field capacity line water will be draining through the soil. This appears to have been occurring on 12 days this month.



9. Pasture grazing residuals have been maintained at 7 rising plate meter “clicks”.

10. The cows on the platform grazed 2.7ha during the week. This was a grazing rotation of about 1/160th of the platform per day

11. We have 5 wintering mobs with the following plans:
    - 100 mixed age – Staying on the milking Platform on grass feed to 7 clicks in the plate meter and no supplement. These cows are lighter conditioned early calvers and will be taken off pasture for the night in very wet conditions. This herd was taken off for two nights and then completely removed from the platform. Weight gain in these cows is critical – what to do with surplus pasture is another question. They will be returned as soon as possible to the platform.
    - 125 mixed age cows, early calvers at an average condition of 4.5 – Grazing nearby on grass initially, now on kale and some straw on a grass runoff paddock.
    - 192 later calving Mixed Aged cows– Grazing at Hororata on kale and good quality cereal silage.
    - 96 Second Calvers at Dunsandel on good quality pasture.
    - 164 Rising two year first calvers also on pasture. They will return to the platform at the end of June for 2 days to receive Teat Seal and be moved off-farm to pasture near Springston following that. They will return to begin calving from July 20th.

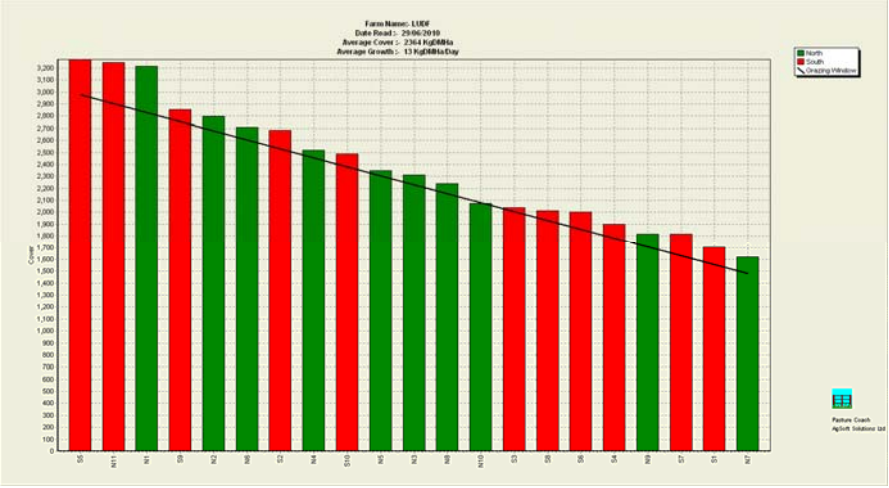
12. It is particularly important that all the herds are being fed to achieve weight gain during June. We are happy with feeding levels of all groups of cows.

13. Pasture growth during the last two weeks has been 13 kg DM/ha. Average Pasture cover is 2,364 kg DM/ha.

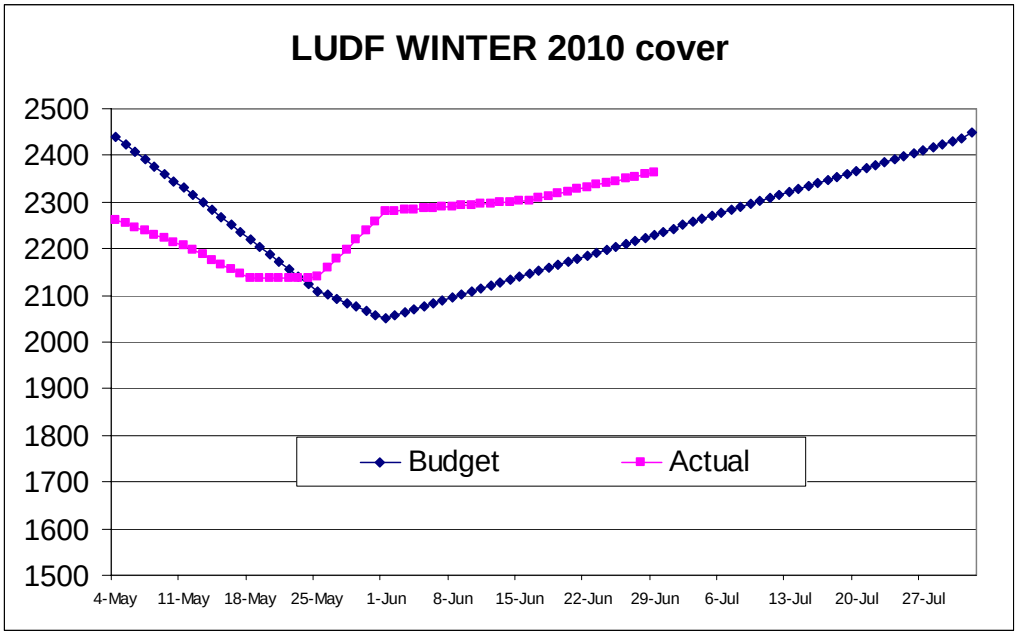
14. Demand from the cows on the platform is 8.3kgDM/ha/day.

15. This weeks' feed wedge is showing a surplus of pasture above the target line. The target line in the wedge reflects the pre-grazing target of 2,980kg DM/ha and a post grazing of 1,480 kg DM/ha, this is the line that represents an average farm cover of 2,230kgDM/ha. The feed wedge has a surplus of 22 t DM. Two weeks ago the surplus was 25 t DM

16. Feed wedge today



17. The feed budget done for the remainder of the winter has a target average pasture cover as shown in the graphic below. The graphic below shows the target line in blue with the actual in pink. We are targeting a cover on the 1st of August of 2,450 kg DM/ha. This cover is what we need to feed the herd on grass without having to feed any supplements until the first grazing round finishes in mid September. Average cover at the end of May was ahead of the target line. We deliberately grazed 125 additional cows on the platform early in June for 5 days to help bring it closer to the target line but this has not been enough and additional cows may be needed during July.



18. Key management decisions to think about this week:
    - Avoiding Pasture Damage on the Milking Platform: This will be the main challenge while the wet conditions remain. This will require the cows to stand in the cow yard or on a race with silage if necessary for any nights when the soil is significantly above field capacity.
    - Managing the feed wedge: Actual cover is ahead of the target. We need to be taking note of the shape of the wedge perhaps needing to graze a paddock in the middle to keep the shape close to the line.
    - Bring lame cows home if necessary: Another cow at Hororata has become lame and we will bring her home during the week to enable the team to mange her.
    - Attending to any other illness in the cows. One cow from the Springston herd was not grazing kale and has been brought back to graze pasture.
    - Achieving the condition targets depends mainly on the feed the cows get during June. Very wet conditions have affected this a little. The post grazing residual and the time when these residuals are achieved are the key tools we use to help monitor feeding levels.

19. There was one new lame cow this week.

20. No mastitis has been located since drying off.

21. The final production for the year was 274,649 (1,726 kg MS/ha – 416 kg MS/cow).

22. No nitrogen fertiliser will be applied until early August. Average of 185kg N/ha over the whole effective 159ha.

23. The eco-n for the autumn was completed in mid May over the 159 effective ha

Next farm walk will be on **Tuesday, 13th July 2010, at 9.00 am. Weekly farm walks will then resume.**
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. Phone SIDDC – 03 325 3629

Management Group
Peter Hancox (Farm Manager), George Reveley (for SIDDC), Virginia Serra (DairyNZ).

LUDF vs Canterbury – Comparing Production and Financial KPI's

Farm Systems Review - 2008-2009 Season

Background

LUDF milk production per hectare has been stable around 1700kgMS/ha for the past five seasons, a figure that is over 30% higher than the average for Canterbury, and which has been achieved with minimal purchased feed. This production has been achieved with stocking rates of 4.0–4.3 cows /ha and liveweight per ha of 1960 – 2100 kg/ha. The resulting profit from this system has placed the farm in the top 1% of dairy farms. The farms no-induction policy and tight calving pattern have steadily improved reproductive performance, and continual monitoring of the drainage water shows below average nutrient loss and effective filtering by the soil to retain any potential microbial pollutants.

Comments from other top farmers in Canterbury, however. have rightly challenged the current system, particularly from farmers with similar systems who are achieving higher production per cow and possibly higher profitability.

In light of these comments, and particularly given the volatile economic times, SIDDC instigated a farm system review in early 2009 to compare LUDF against other top farmers and possibly model alternative strategies to ensure the current stocking rate, calving date, use of supplements etc remains relevant for this farm. The 2009 review used DairyBase data from the 2007-08 production season, as that data set was the most reliable, complete set of data available at the time for this detailed level of comparison.

This analysis has recently been repeated using the 2008-09 data. In 2007-08, 13 farms were able to provide a full set of data, while in 08-09 the comparison has extended to 20 farms. The 2007-08 review placed LUDF as second most profitable farm in the group. Key drivers for profitability as identified from the 2007-08 data were

1. Pasture Eaten tDM/ha
2. Operating Expenses ($/kg MS) and to a lesser extent,
3. Stocking rate (cows/ha)

Methodology

Farm Selection

28 irrigated dairy farms with a reputation for highly profitable systems and reliable physical and financial data sets were identified from a range of sources including DairyBase, local accountancy databases and industry representatives recommendations. The farms range from Culverden to South Canterbury and included a range of farm systems and business arrangements, including owner operators, managed farms, equity partnerships, and 50:50 sharemilkers. In the case of sharemilked farms, the costs and incomes of owners and sharemilkers relating to the farm business were combined to produce a "whole business".

The farms needed to have good records and give the Farm Systems Review project the authority to use and report their information on their production system. Personal information regarding business funding, drawings, tax etc. was not to be reported. All information gathered is confidential.
It was necessary, in some cases, to collect some further information from farmers to generate physical KPIs (extra information on sharemilking agreement etc. as appropriate).

The information gathered was in the form of DairyBase reports. These were combined in a spreadsheet to report drivers of profit. In the final analysis, data from some farms could not be fully validated (as per DairyBase protocols) reducing the final number of farms to 20.

Standardised Milksolids Payment
The return from milk sales was standardised to the Fonterra payout received of $5-20 per kg MS for the 2008-09 season (ie all milk related income in the analysis was attributed to the milk supplied during the 2008-09 season, multiplied by the individual farms 2008-09 milksolids composition). All farms were spring calving Fonterra suppliers; there were no organic and only one winter milk supplier.

Drawing conclusions from the analysis
A large number of graphs have been considered in the analysis of this farm system review; and in the search for drivers of profit within these farms. Data for each farm is displayed as an individual point as it intersects the two variables. Trend lines have been applied and where meaningful, relationships identified using R^2 values to show the percentage of movement that can be explained by linear regression. An R^2 value of 1.0 (or 100%) shows a direct, linear relationship between the variables while an R^2 value of less than 0.3 (30%) shows only 30% of the relationship between the 2 sets of numbers [eg. Operating Profit and Cost of feed] is explained by linear regression. The rest is likely to be the function of many other criteria including unexplained random noise.

It is also helpful to consider the slope of the trend line, particularly in terms of the direction of the slope (ie positive or negative). A high r-squared value can be associated with a positive or negative slope.

Summary of Key Results from 2008-09

- Figure 1 shows a **strong and negative relationship between operating expenses per kg MS and operating profit /ha.** Low operating expenses per kgMS are a good indicator of higher profitability per hectare.
- **Little relationship was apparent** on these farms **between milk production and profit** – either on a per cow or per hectare basis. Similarly, no relationship was evident between stocking rate and profit per hectare.
- Total feed expenses show a weak, **negative relationship to operating profit.**
- Maximising farm profit is a function of many aspects, not simple one-to-one relationships.

Analysis of KPIs and Operating Profit/ha

The relationship between Operating expenses per kg MS produced and Operating profit per ha is clear and strong. This was the key driver of profit for this group of farms in the 2008 -2009 season.

Figure 1

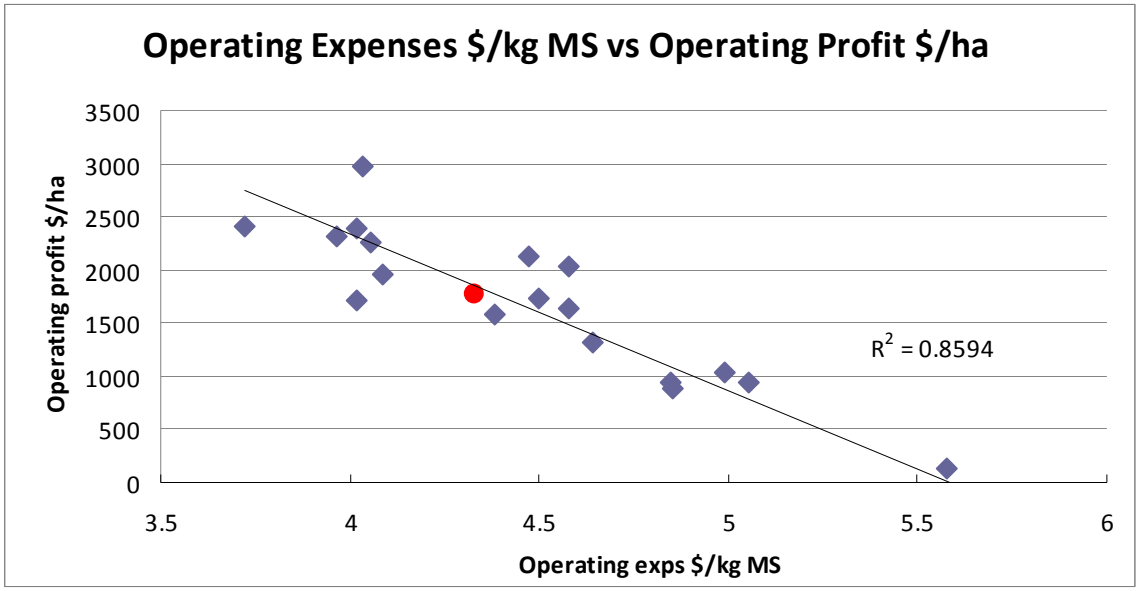


Figure 2 [below] shows that the relationship between operating costs per ha and operating profit per ha is not as strong as the relationship shown in Figure 1. This is because profitability is dependent on getting high production. This weakening in the relationship is supported by the graphs showing the relationship between profit/ha and stocking rate & MS/ha (Fig 4 & 5).

Figure 2

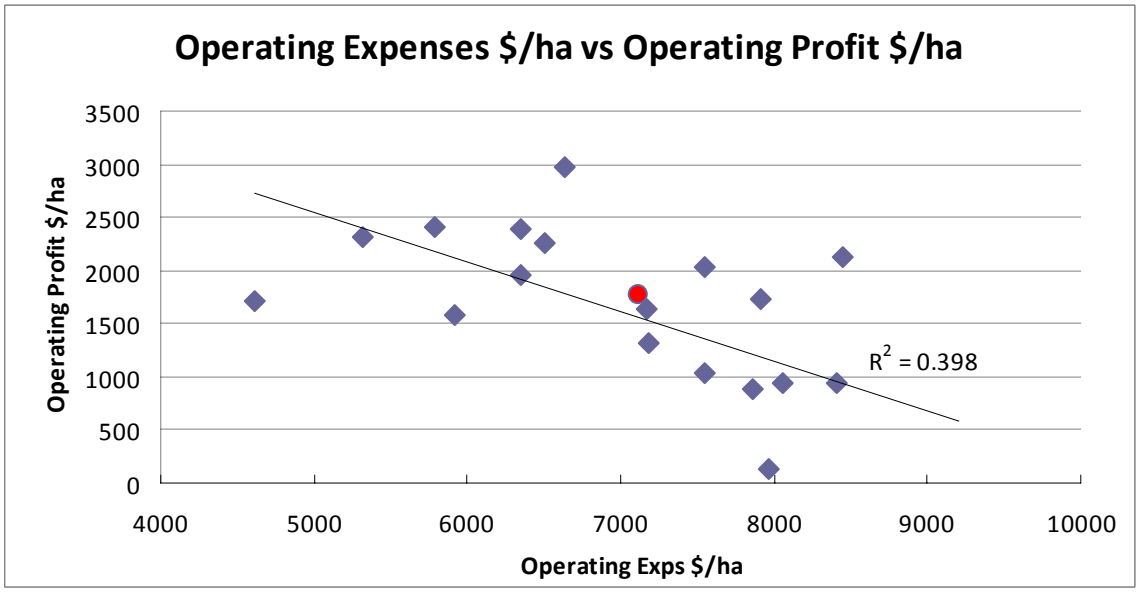
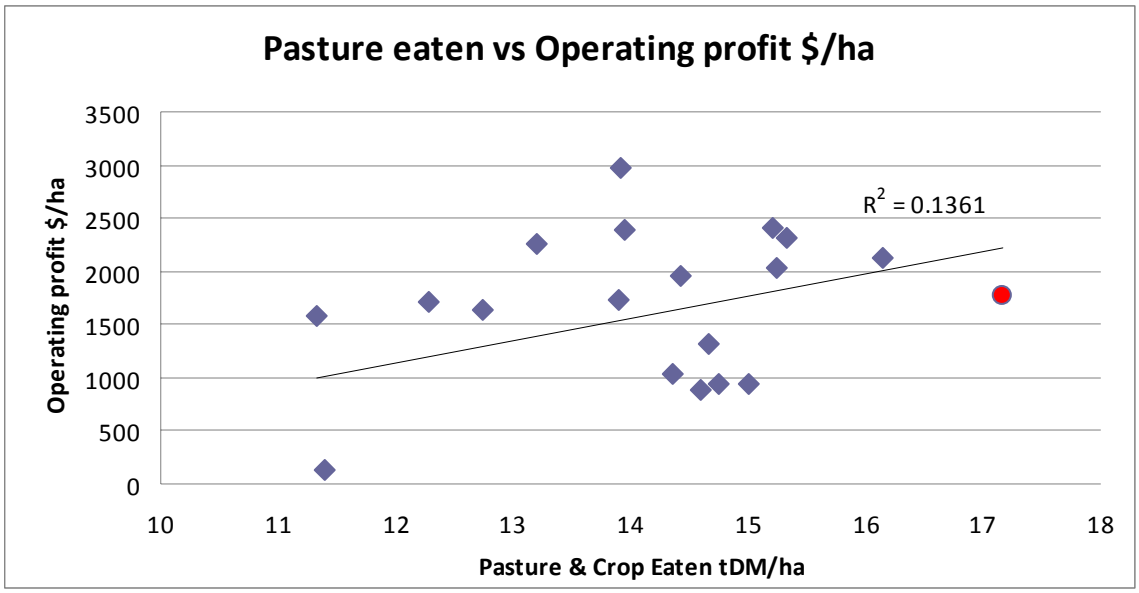


Figure 3



In contrast to earlier seasons analyses, pasture eaten [Figure 3], and the per cow indices [figures 4, 5, and 6] do not show through as a key driver of profit for this group of farms. This is not saying these are not important, but we do not see them in this observation with enough difference between farmers in the group that would mean that farmers are gaining advantage over other by having different levels of performance. Other issues within the group are simply being more influential.

Figure 4

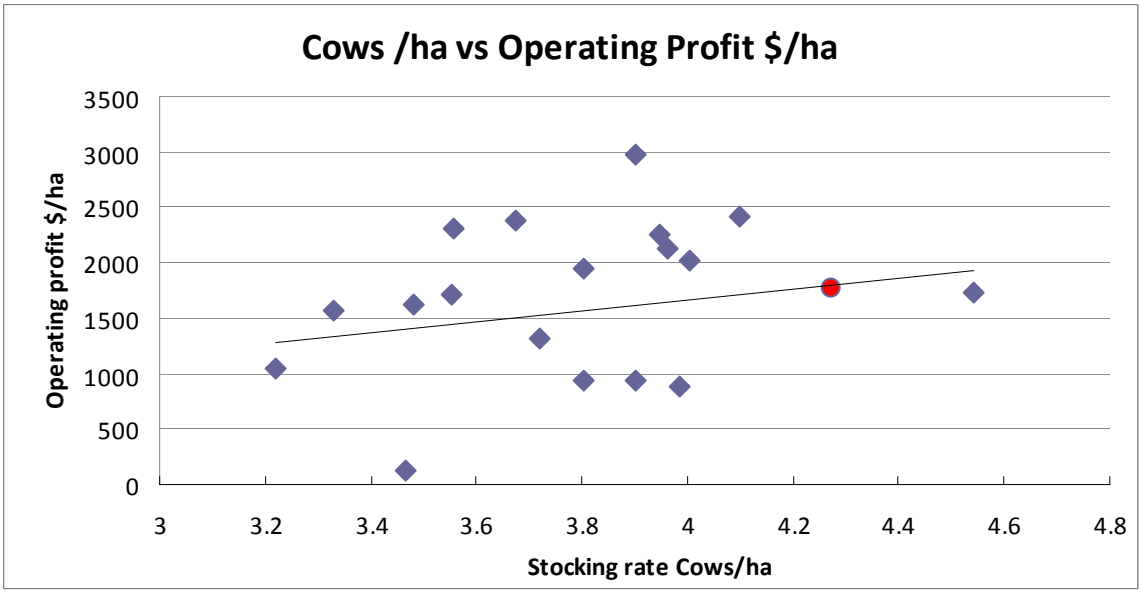


Figure 5

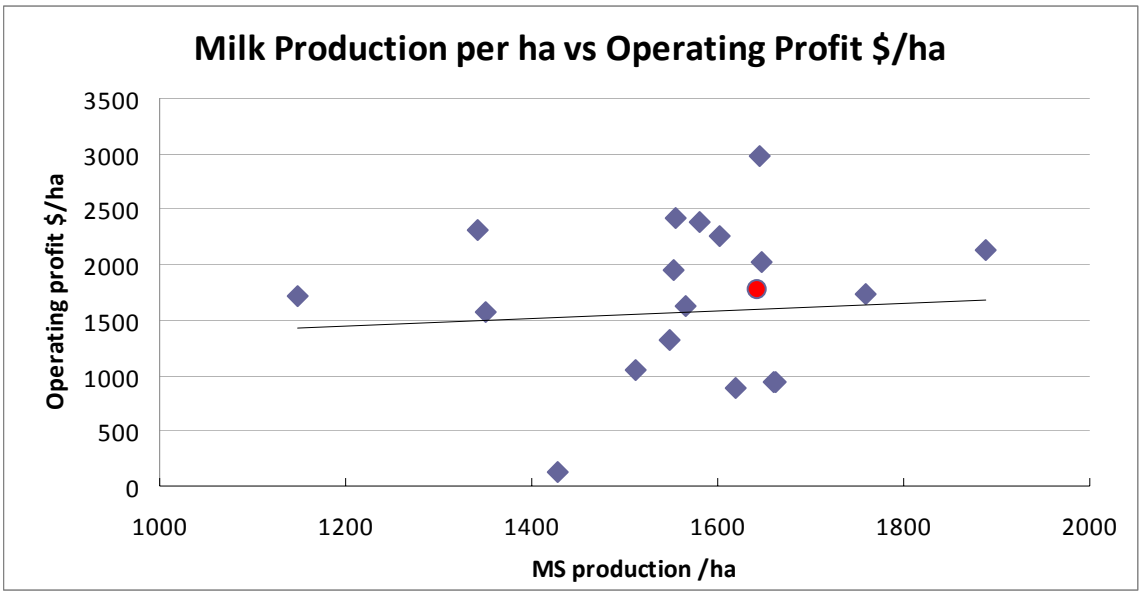
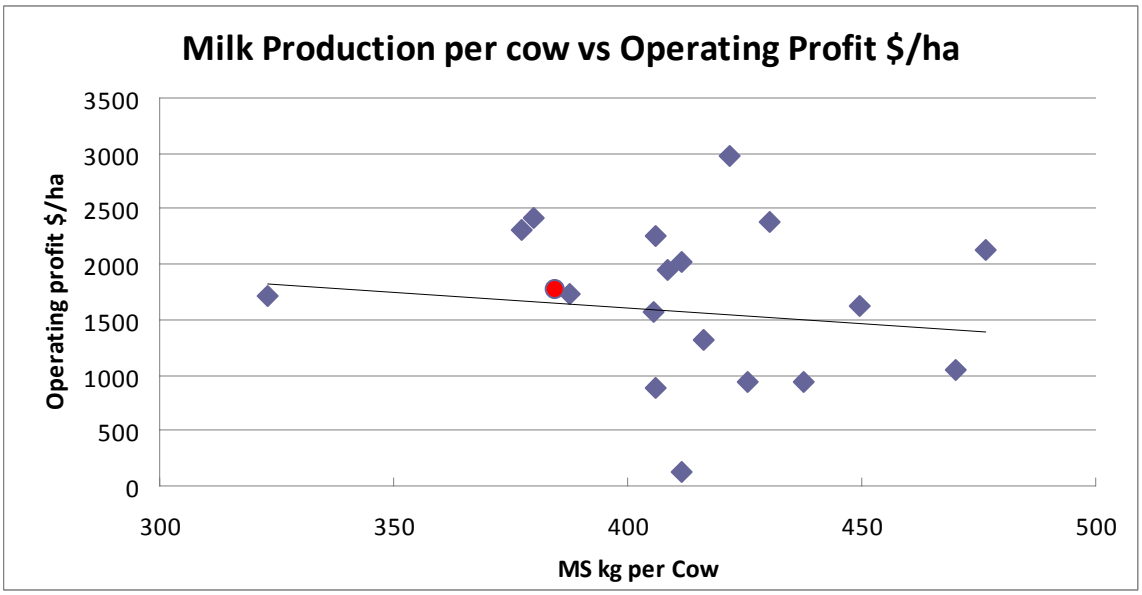


Figure 6



LUDF has a higher BW [figure 7] than any other farm in the review. The trend-line shows a small positive relationship between BW and operating profit.

Figure 7

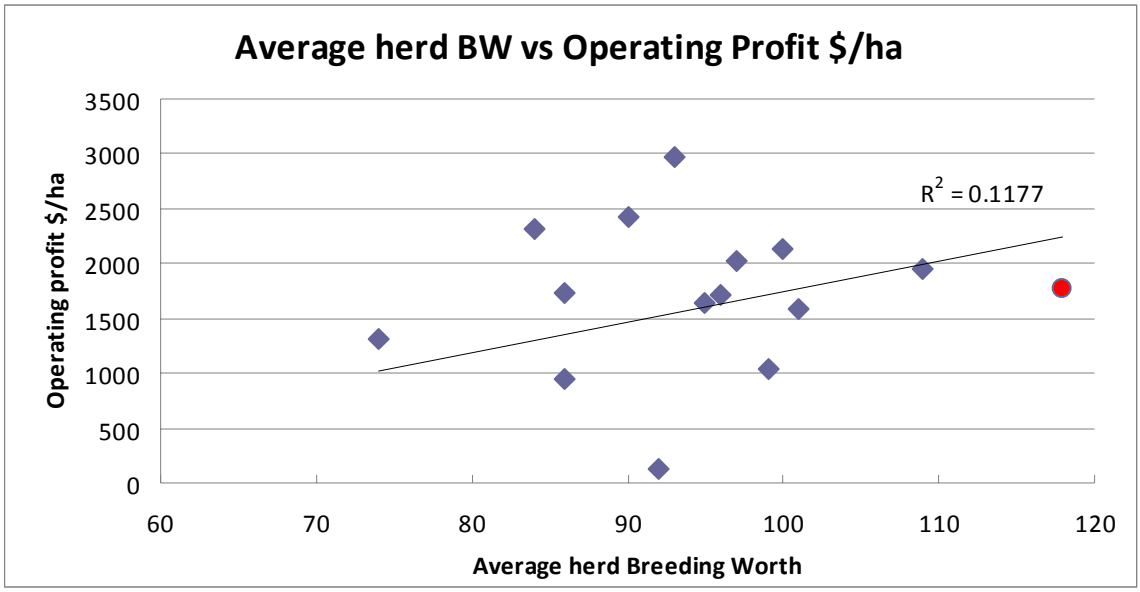


Figure 8

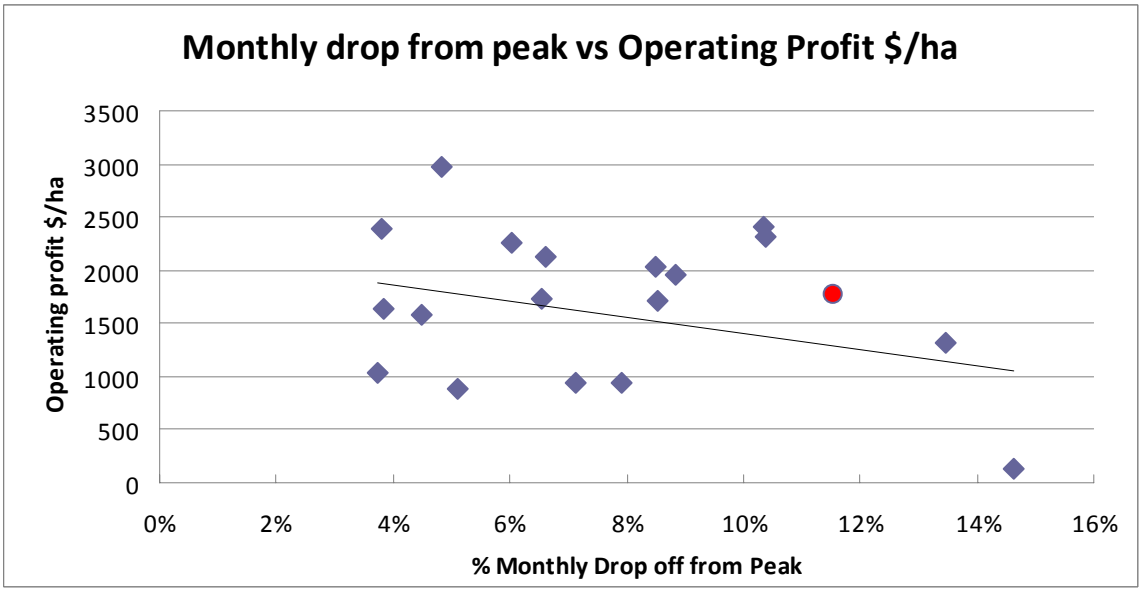
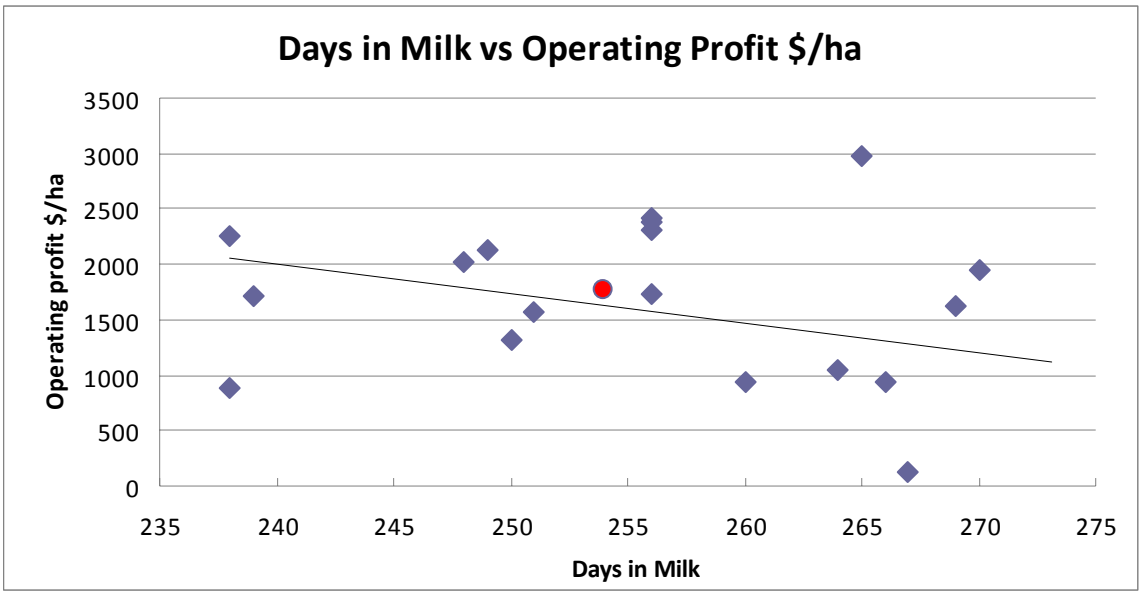


Figure 9



In Figure 9 there is a little relationship between days in milk and operating profit/ha for this group and year. This may be because of the cost of supplements required to achieve increased days in milk.

Feeding Indices

Figure 10

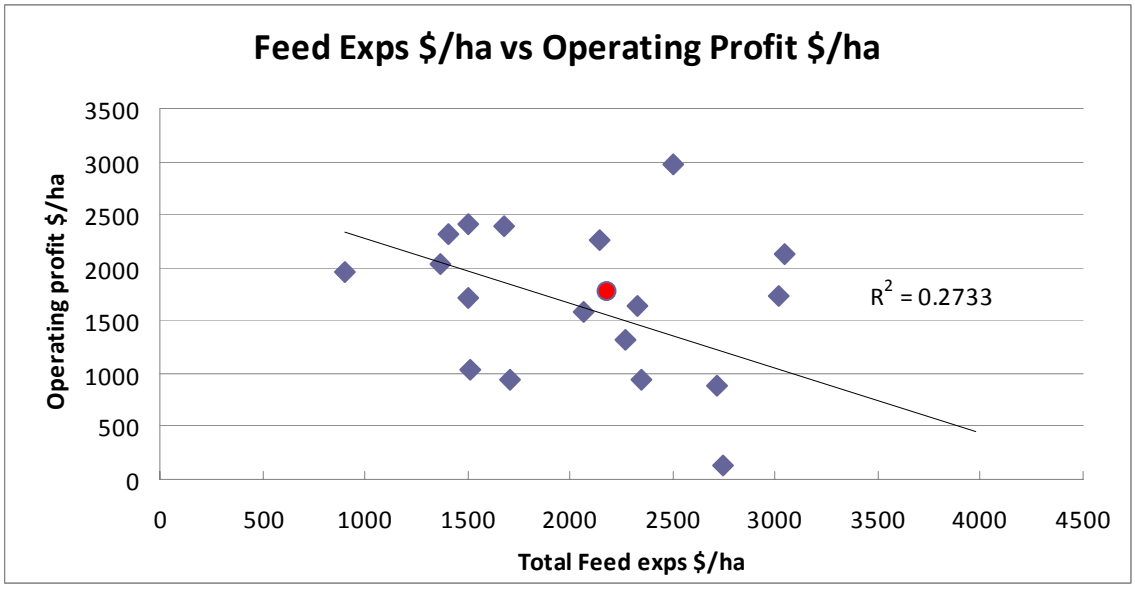
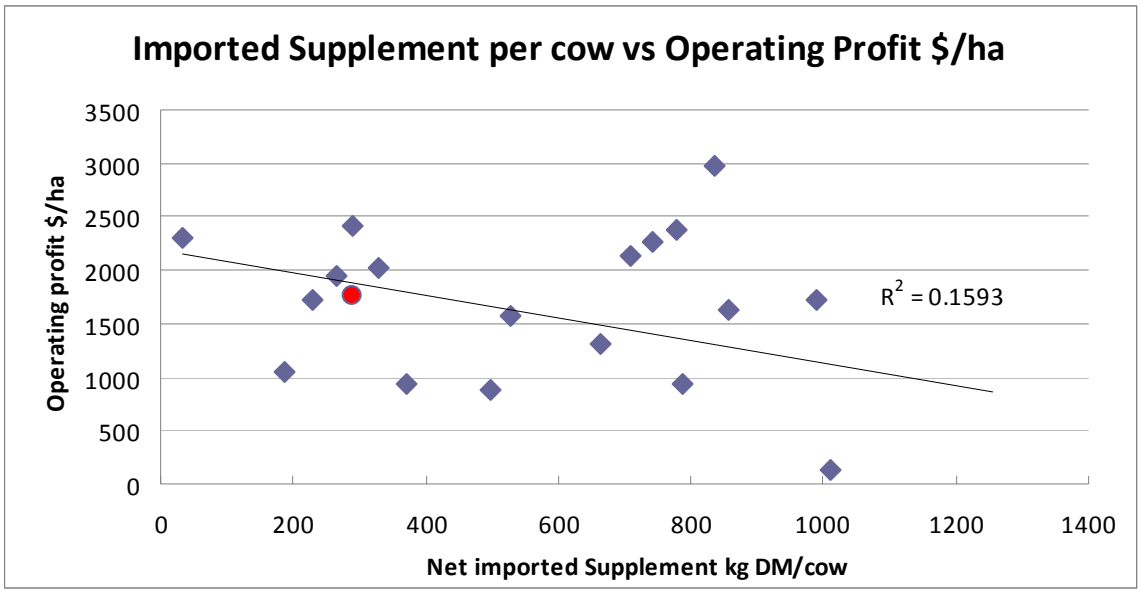


Figure 10 shows a negative relationship between feed expenses and operating profit suggesting that it is not just how much supplement that farms used (figure11) but what it costs on a unit basis. Some data which we looked at suggested that there is a negative relationship between the cost per Kg of Supplement and operating profit. This would be both logical and understandable because higher priced supplement is going to erode the profit margin at a greater rate than cheap feed.

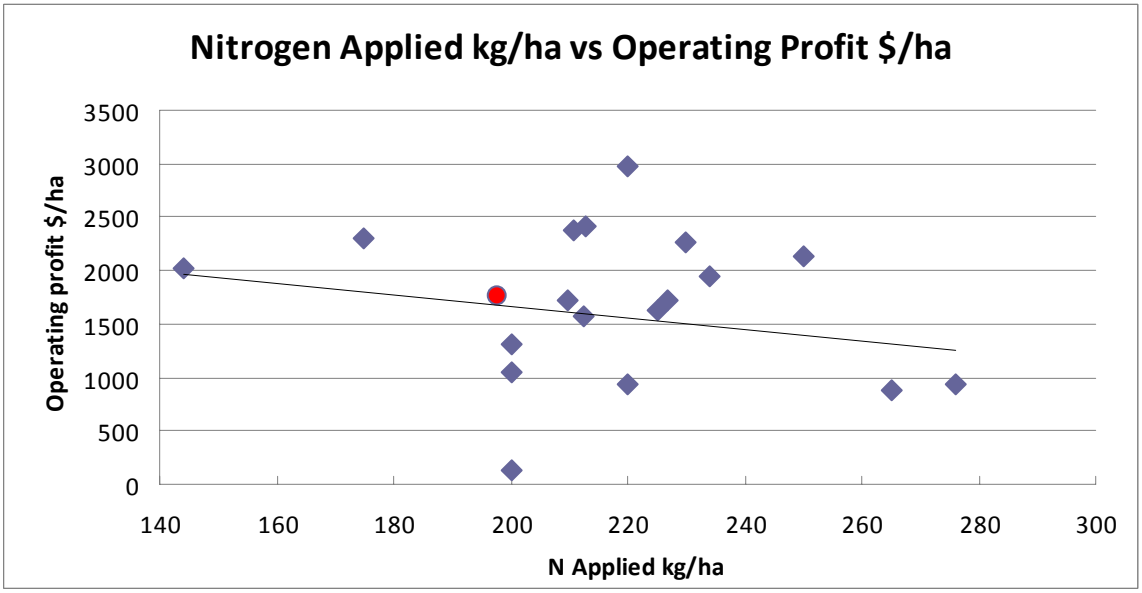
Figure 11



Nitrogen

Figure 12 shows there is no relationship between the level of nitrogen applied to the farms in the group and operating profit. This is not to suggest that the N applied has not grown more pasture, but that this may not have been utilised with equal efficiency by all farms and that other inputs and activities on the farm have confounded the effect of the Nitrogen in terms of profit.

Figure 12



What has been graphed?

In order to get a clear understanding of the drivers of profitability, we have investigated many parts of the farm business. Below is a list of all the graphs that were made, the only reason that they are not included in this handout is that they did not show any meaningful relationship or trend. Each of these measures was graphed against operating profit/ha.

Cows/ha	Opex $/kg MS
Milksolids/ha	Empty Rate
Milksolids/cow	% Herd entering as heifers
LWT/ha	% first calvers start 2nd Lactation
Breeding Worth	% Herd Calved at 3 weeks
Production Worth	% Herd Calved at 6 weeks
Nitrogen applied for year (L2)	% Herd Calved at 9 weeks
Milksolids per cow as % of Liveweight	Supplements purchased, Made and cropped
% drop monthly productn from peak -31Dec	Total Supplement Expenses
Days in Milk	Total Supplement exps$ /ha
Pasture (crop) Eaten t DM/ha	Net imported Supplements per t/Ha
Net imported Supplements per Ha	Net heifer/General grazing
Grazing Eaten per hectare	Net winter grazing
Total Feed Eaten (T D/ha)M	Net cost of leased runoff land
Net imported Supplements kgDm per cow	Owned Run-off Adjustment
Imported supplements & Grazing eaten kg DM/cow	Total Grazing & Run Off Expenses
Imported suppl excl grazing as a % of total feed	Total Feed Expenses
Grazing off as a % of feed offered	Effective Area : Run-off Area (Ha)
adj Payout	Cows Milked Per Total FTE
adj MS income $/ha	Milksolids Per Total FTE
Net revenue from dairy livestock	Total Labour Expenses
Change in Dairy Livestock Value	Total labour expenses $/ha
Total Other Dairy Farm cash revenue	Total An Health and breeding
Total Net non MS Dairy income	Animal health and Breeding $/ha
Effective Area : Milking Platform (Ha)	Olsen P (ave)
Other Dairy Farm cash revenue $/ha	Total Feed Expenses
Dairy Revenue $/ha	Effective Area : Milking Platform (Ha)
Operating Expenses/ha	Total feed exps $/ha
Total adj opex $/ha	Total fertilizer exps $/ha

Mini Comparison - 2009/10 Season

Comparing LUDF to 4 high performing farms

To complement the LUDF farm system review done for the 2007-08 and 2008-09 seasons a smaller comparison between LUDF and four 4 high performing farms was also carried out for the just completed 2009/10 season. These farms are geographically spread and located in, Culverden, Te Pirita, Hinds and Winchester.

We decided to do this analysis to check if the main drivers for profit identified for the last two seasons were still relevant for this season, and if we could identify any other aspects from these highly profitable businesses.

Since accounts are not finalised yet for the season 2009/10 we used the latest cash flow for the season for the financial information. Please keep in mind that there may be small changes in some income and costs but these changes are not likely to represent more than $50 of Operating Profit per ha.

For the physical analysis we used the DairyBase reports as in the previous analysis.

Three of the farms selected were DairyNZ Tight Management farms with detailed information reported as part of that campaign to describe the farms and their strategic decisions over the past year.

Season 2009/10 – Key Characteristics

- Most farmers prepared a very lean budget at the beginning of the season after the $4.55 /kg MS payout was announced. The theme was “tight management for tight times”. Many farmers maintained this approach and only small changes to the system were done after the further increases in forecasted payout were announced.
- Feed price have been for most of the season at a lower level than usually, especially grain and PKE at the first half of the season.
- The weather has been kind most of the season with a reasonably dry early spring and good grass growing conditions across the majority of the Canterbury plains, over much of the season. The cooler than average summer with more overcast days benefited many dairyfarms, especially those located in more extreme environments and irrigation systems that do not keep up with high evapotranspiration rates. This situation was particularly evident in areas such as Culverden in North Canterbury. May was wet, mainly in the last 2 weeks creating some challenges when drying off cows.

What did we find?

FINANCIALS:

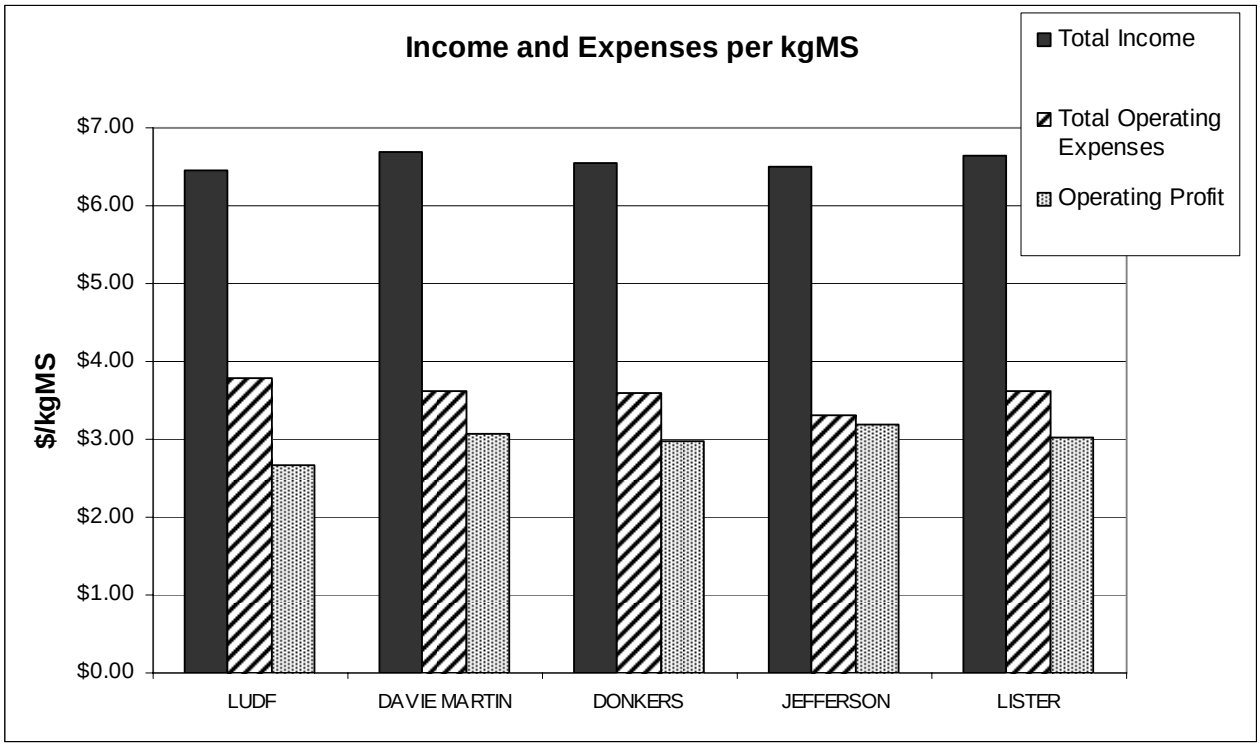
- LUDF had the lowest Gross Farm Income / kg MS of this group. The highest GFI/kg MS of the group was $6.71 &/kg MS and the average was $6.62 /kg MS, compared to LUDF at $6.47 /kg MS. The main difference was in Stock income (LUDF = 10 cents /kg MS compared to the average of the group at 20 cents/kg MS; also LUDF had no other income compared to the average of the group at 4 cents/kg MS).
- LUDF had the highest Operating Expenses / kg MS in the group. The lowest operating expenses for the group was $3.31 /kg MS, the average for the group was $3.59 /kg MS and LUDF was $3.79 /kg MS.
- Comparing the operating expenses (LUDF & average of the group) the main difference in costs were:

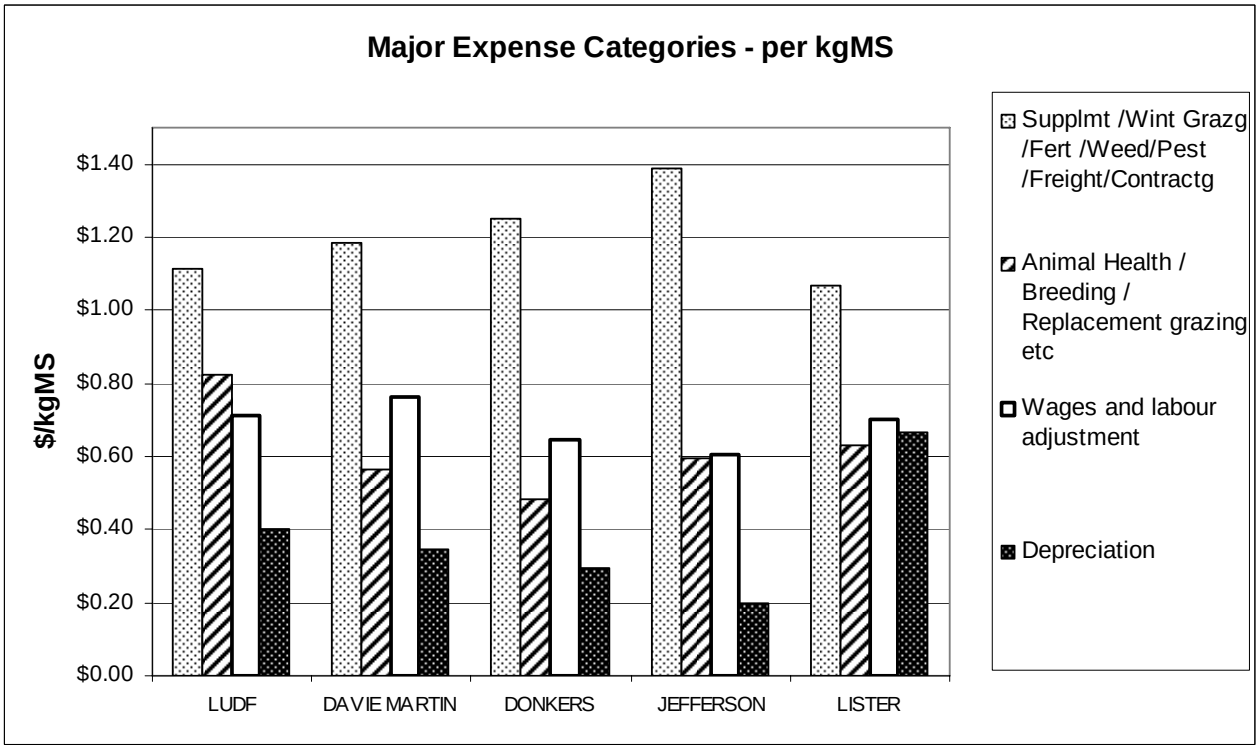
	LUDF	**Group average**
Animal health	18 cents /kg MS	16 cents /kg MS
Breeding expenses	12cents /kg MS	8 cents /kg MS
Fertilizers	39 cents /kg MS	33 cents /kg MS
Administration	14 cents /kg MS	9 cents /kg MS

- Other costs that LUDF was the second highest were Irrigation, Feed costs and Depreciation.

PHYSICAL KPI's:

- LUDF had the highest cows/ha and the second highest kg Live Weight /ha.
- LUDF had the highest pasture and crop eaten /ha (16.2 t DM/ha vs 15 t DM/ha average for the group).
- LUDF had also the highest percentage of heifers in the herd (27% vs 21% for the lowest in the group).
- Nitrogen used at the LUDF was the lowest at 185 kg N/ha compared to 237 kg N/ha average for the group.
- This season LUDF harvested 42% of its area as grass silage compared to 28% for the average of the group.
- LUDF had the lowest production per cow - 415 kg MS/cow vs 460 kg MS/cow average for the group.
- Also kg MS/kg Live Weight was the lowest at LUDF at 0. 89, the average was 0.95, and 1 kg MS/kg LW was the highest in the group.
- Peak production was similar for most farms but LUDF had the highest monthly drop from peak to the end of December (9.8 % vs 7% for the average).


Income and Expenses per kgMS
Total Income
Total Operating Expenses
Operating Profit
$/kgMS
$7.00
$6.00
$5.00
$4.00
$3.00
$2.00
$1.00
$0.00
LUDF
DAVIE MARTIN
DONKERS
JEFFERSON
LISTER


Major Expense Categories - per kgMS
$/kgMS
$1.40
$1.20
$1.00
$0.80
$0.60
$0.40
$0.20
$0.00
LUDF
DAVIE MARTIN
DONKERS
JEFFERSON
LISTER
Supplmt /Wint Grazg /Fert /Weed/Pest /Freight/Contractg
Animal Health / Breeding / Replacement grazing etc
Wages and labour adjustment
Depreciation

How are the details calculated?

- Milk Income= (Kg Fat * $/kg Fat) + (kg Protein* $/kg Protein) – Volume Adjustment – DairyNZ levy + Dividends
- Stock Income: Sales - Purchase +/- Stock Adjustment
- Stock Adjustment= (Stock Number at Closing – Stock Number at Opening)* set value per head
- Change in Feed Inventory was used to calculate feed cost for the season
- When non-paid labour is used an adjustment is included
- Depreciation was estimated from last years accounts so final value may have small changes to the value used here
- Pasture Eaten is calculated assuming pasture quality at 11MJME/kgDM
- Supplement bought-in and eaten is bought in less made on milking platform

INCOME $/kg MS	**JEFFERSON**	**LISTER**	**DAVIE-MARTIN**	**LUDF**	**DONKERS**	**AVERAGE**
Milk Income	6.37	6.38	6.37	**6.37**	6.40	6.38
Net Stock Income	0.23	0.27	0.30	**0.10**	0.10	0.20
Other Income	0.06	0.00	0.04	**0.00**	0.09	0.04
Total Income	**$6.67**	**$6.66**	**$6.71**	**$6.47**	**$6.59**	**$6.62**
EXPENSES $/kg MS	**JEFFERSON**	**LISTER**	**DAVIE-MARTIN**	**LUDF**	**DONKERS**	**AVERAGE**
Wages	0.61	0.70	0.76	**0.71**	0.64	0.68
Animal Health	0.17	0.17	0.16	**0.18**	0.10	0.16
Breeding/testing	0.11	0.08	0.04	**0.12**	0.07	0.08
Shed Expenses	0.03	0.07	0.03	**0.02**	0.03	0.04
Calf Costs	0.01	0.02	0.03	**0.00**	0.00	0.01
Farm Working	0.02	0.00	0.01	**0.00**	0.00	0.01
Electricity	0.05	0.17	0.19	**0.07**	0.03	0.10
Irrigation	0.12	0.02	0.02	**0.28**	0.39	0.17
Feed (made & purchased)	0.52	0.18	0.30	**0.27**	0.34	0.32
Winter Grazing	0.45	0.57	0.43	**0.39**	0.47	0.46
Young Stock Grazing	0.30	0.36	0.34	**0.52**	0.31	0.37
Fertilizers (inc N)	0.31	0.22	0.35	**0.39**	0.37	0.33
Weeds and Pests	0.03	0.00	0.02	**0.00**	0.02	0.01
R&M	0.09	0.18	0.18	**0.10**	0.25	0.16
Vehicle Expenses	0.08	0.02	0.15	**0.07**	0.03	0.07
Freight General	0.01	0.04	0.05	**0.00**	0.00	0.02
Administration	0.06	0.01	0.13	**0.14**	0.09	0.09
Regrasing & Contracting	0.07	0.05	0.04	**0.06**	0.05	0.05
Rates and Insurance	0.08	0.10	0.06	**0.06**	0.08	0.08
Depreciation	0.20	0.66	0.34	**0.40**	0.30	0.38
Operating Expenses	**$3.31**	**$3.62**	**$3.63**	**$3.79**	**$3.58**	**$3.59**
F.W.E /kg MS	**$2.88**	**$2.96**	**$2.99**	**$3.39**	**$3.29**	**$3.10**
Operating Profit /ha	**$6,901**	**$5,272**	**$5,145**	**$4,615**	**$4,507**	**$5,288**

SEASON 2009/2010	JEFFERSON	LISTER	DAVIE MARTIN	LUDF	DONKERS	Average
Effective ha (MP)	140	143	141	159	306	177.8
Run Off	6	0	0	0	0	1.2
Cows	560	554	495	660	1020	657.8
Kg MS	287,493	248,253	235,453	273,605	458,786	300,718
KG MS/Cow	513	448	476	415	450	460
kg MS/ha	2054	1736	1670	1721	1499	1736
Cow Shed	R54	R50	H 40	R50	R50	0
Production System	3	3	3	3	3	0
Main Irrigation System	Spray	spray	Spray (RR)	Pivot	spray RR	0
PSC (MA cows)	2 Aug	3 Aug	4 Aug	8 Aug	4 Aug	0
FAt	161,918	139,489	133,981	154,970	256,543	169,380
Protein	125,574	108,764	101,472	118,635	202,243	131,338
Kg MS	287,492	248,253	235,453	273,605	458,786	300,718
% MS	8.73%	8.76%	8.76%	9.15%	8.80%	8.84%
Fat /Protein	1.29	1.28	1.32	1.31	1.27	1.29
Cows /ha	4.00	3.87	3.51	4.15	3.33	3.77
Kg LW /cow	500	465	490	465	480	480
Kg LW/ha	2000	1801	1720	1930	1600	1810
BW/reliability	119/50	86/46	104/49	120/48	113/45	0
PW/ reliability	141/72	101/67	126/72	138/64	142/60	0
Total FTE	2.5	3	3.2	3.6	6.4	3.74
Cups/FTE	21.2	16.4	12.6	13.7	7.8	14.34
Cows/FTE	220	182	155	181	159	179.4
Kg MS/FTE	112,890	81,394	73,964	75,166	71,685	83,020
Kg MS as % LW	100%	96%	97%	89%	94%	95%
Peak Production kgMS/cow/day	2.3	2	2.2	2.1	2	2.12
Montly Drop from MP to end Dec	5.3%	5.7%	6.4%	9.8%	7.0%	6.8%
DIM/cow	273	248	270	266	265	264
% Heifers on the herd	24%	21%	23%	27%	22%	23%
% cows 1 Dec as % wint cows	98%	99%	94%	96%	96%	97%
kg N/ha	250	272	253	185	226	237.2
kg supplem imported t DM eaten /ha	2.8	1.6	0.6	1	1.7	1.54
Grazing off t DM eaten /ha	3.8	2.5	2.2	3.2	2.2	2.78
Pasture & Crop Eaten /ha	16	15.4	15.6	16.2	13.3	15.3
Total Feed Eaten	22.6	19.5	18.4	20.4	17.2	19.62
% Util import suppl	91%	90%	74%	85%	89%	86%
MJME/kg DM imp supp.	11.7	11.3	9.8	11.2	11.8	11.16
Main Supplement Type	Grain	Grain/PKE	PKE/ Grass Silage	Baleage	Baleage /Grain	0
Area harvested for silage (%)	30%	29%	29%	42%	9%	28%
Topping	yes	yes	yes	no	yes	0
6 weeks in calf (%)	65%	65%	73%	74%	71%	70%
Mt Rate (%)	9%	9%	11%	13%	9%	10%
Weeks Mating	15	15	15	10	15	14
% Inductions	6%	2%	0%	0%	15%	5%
% CIDRS	17%	0%	13%	0%	0%	6%
% Cows Treated Lameness	10%	4%	8%	19%	12%	11%
% Cows Clinical Mastitis (1st-6 weeks)	11%	10%	6%	9%	18%	11%
Av SCC for season	163,000	182,000	149,000	167,000	180,000	168,200

LUDF vs Canterbury

Summary of 3 Years Profit Comparison

- **Have the drivers of farm profit changed?**
- **Options and opportunities for volatile times**

Benchmarking against individual farms or groups of farms is an important tool to help set targets and compare performance, and may identify areas for small or large changes in efficiency and profitability. However, it is also possible to over-analyse and miss the available opportunities.

As no two farms have identical resources, multi-farm analysis should not be seen as the way to define the perfect recipe for success – as this will only be evident with hindsight. Nevertheless, comparison with other farms provides useful and powerful information to ensure any farm is using its available resources in the most efficient, sustainable and profitable manner.

Comparing LUDF with a range of similar, high performing farms over three years (with variable payouts, and resultant profitability) has identified farms with greater profitability than LUDF. System and financial analysis shows more similarities than differences, suggesting constant attention to detail in all areas is required, and little gains in many areas add to important differences in the bottom line.

It appears that the drivers of farm profit (simple efficient farm systems, high pasture production and utilisation, focus on cost control) have not changed but some of the solutions may have. For example, low priced pasture silage had previously enabled Canterbury dairy farms to efficiently source supplementary feed. In recent years, PKE and at the present time, grain, have often been a more cost effective feed for those farmers with adequate infrastructure to utilise these feedstuffs. LUDF does not have the necessary infrastructure and has, to date, chosen not to utilise these options, instead staying with purchased pasture silage.

Analysis with LUDF shows some farmers have (in the current environment) set up their farms very well to use additional feed to maximise milk production from the milking platform. This can dilute the cost of most other aspects of the business, but as a single factor has been shown to have little direct bearing on increasing profitability. The analysis is not able to address issues of long term sustainability of these systems – but very high profits go a long way to supporting infrastructure costs etc.

LUDF has also made strategic decisions to ensure it maintains the long term productive ability of the farm and lessen its environmental footprint which may translate to higher fertiliser, R&M and breeding costs than the comparison farms. For example, breeding decisions at LUDF are focussed upon moving the herd from the top 5% in BW to the top 1%. This is to achieve long term gains from the cumulative benefits of higher BW animals. The nil induction policy is a similar example at LUDF that impacts on LUDF costs.

In summary, the comparison between LUDF and similar farms highlights a number of useful criteria:

1. Dilution is important - ie dividing expenses over as much milk production as possible is likely to result in lower costs, so long as the base farm business is sound, low cost farming.
2. Intense focus on cost control and production together can deliver outstanding results – as evident in the DairyNZ tight management farms over the past 12 months.
3. Being flexible to adapt to opportunities is necessary to stay at the top of the game - eg PKE at less than 5% expected payout, rising payout - therefore re-visit R&M, keeping some costs optional depending on actual vs forecast payout.
4. Don't erode the long-term profitability of the business - herd fertility / soil nutrient status / R&M can all be cut in the short term, but have long term consequences (little and often is better than a poorly maintained farm that breaks down at key times).
5. Keep looking for efficiencies - even small ones add up over time - eg aquaflex to avoid overwatering, renovating small less productive areas on an ongoing basis.
6. Do the basics really well
    a) Grow as much grass [of the highest quality] as possible, and utilise directly by the milking herd
    b) Look after the herd – healthy, productive animals for system 3 farms should be producing between 90-100% of their liveweight as milk-solids
    c) Train and retain staff so they act as you would
    d) High quality feed can be valuable (if purchased cost effectively)
    e) Budget aggressively to control costs and monitor spending constantly
    f) When additional purchases, especially feed, are being considered, a business case should be prepared and the final decision based on its outcome
    g) Attention to detail in all aspects of the farm operation.
7. Supplementary feed and winter-grazing costs are substantial in South Island Dairy businesses. Maximise their contribution by purchasing well, maximising utilisation and using to increase pasture utilisation (and thus milking platform profit).
8. There are NO silver bullets – though successful for someone else, more nitrogen, using grain/PKE, high BW cows, alternative irrigation systems - may not give another similar farm ANY advantage.
9. Take a long term view to changing farm system, especially where the costs of change are high and infrastructure is required (but be quick to change when there are clearly low cost benefits with short payback periods).
10. Equally, don't bury your head in the sand - just be very aware of the likely volatility in future income and expenses.
11. ***It is the skill of dairy farming to combine all these factors in the best possible manner to maximise long-term sustainable profit***

Clover root weevil (CRW)

The **clover root weevil** *Sitona lepidus* is a serious white clover pest. Found in many parts of the world, CRW was first discovered in the North Island in 1996 and by the end of 2005, had spread throughout the North Island. In January 2006, a small number of CRW were found at and around Christchurch airport. Subsequently, populations have been found in the regions of Nelson, Malborough, Canterbury, Otago and Southland. Farmer experience and research in the North Island has shown that CRW can have a significant impact on white clover productivity.

How to identify clover root weevil

Clover root weevil (CRW) has four distinct stages in its life cycle: egg, larva, pupa, and adult. The eggs and pupae are extremely difficult to find, while **adults** can sometimes be seen.

The most obvious sign of CRW is the distinctive **notching** on clover leaves caused by adult feeding. If notching is observed, further evidence of CRW can be found by digging up some clover plants to look for **larvae** in the top 5 cm of soil near clover roots

CRW larvae

CRW larvae live in the soil, where they feed on clover roots and nodules. The larvae are small creamy white grubs, from 1-6 mm long, with a brown head capsule. They may be found by digging into the root zone under white clover plants.
CRW larvae are generally much smaller than grass grub larvae, which are also common in pastures, and lack the distinctive C-shape and bulbous tail that characterise grass grub.

CRW adults

Clover root weevil are a type of beetle. The adult CRW is a mahogany-brown weevil, 4-6 mm long, with a short, blunt nose. Unfortunately, it can be difficult to tell adult CRW apart from other similar weevils which are commonly found in New Zealand pastures such as the related species *Sitona discoideus* (lucerne weevil) and the smaller Argentine stem weevil.

Damage to clover

Feeding by adult CRW causes distinctive semi-circular notching on the edges of clover leaves. These notches are symmetrical and uniform, unlike the jagged notching caused by some other pasture pests, such as slugs and clover flea. The adults feed on clover foliage, but generally do not cause significant damage in established pastures. CRW adult feeding can however, kill a large proportion of white clover seedlings in newly sown pasture.

Note: Some other weevil pests like little fringed weevil may cause similar notching in clover, and occasionally may become abundant enough to cause noticeable damage.

Notching on white clover, caused by clover root weevil adult feeding

CRW larvae feed on the roots of clover, injuring the roots and damaging the nitrogen-fixing nodules. This reduces the vigour of the clover. The additional use of nitrogen fertilisers is needed to maintain pasture quality. Under severe CRW larval infestations white clover can temporarily disappear from the sward.

Damage to white clover roots caused by clover root weevil larval feeding

Farmer experience, backed by research from AgResearch scientists, has shown that CRW is a serious pasture pest. Because larvae are present all year round, they put continual pressure on clover, and reduce the ability of plants to fix atmospheric nitrogen, reduce growth and make clover more vulnerable to stresses such as drought, disease and poor pasture management. Even when growing conditions are good, research has shown that modest populations of only 300 larvae/m^2 will reduce annual clover production by 1000 kg dry matter/ha.

What about insecticides?

Clover root weevil (CRW) is difficult to control in pasture, partly because the larvae live in the soil which makes them difficult to kill with insecticides. Also, the adults are very mobile and can fly, so treated pastures can be rapidly reinvaded from surrounding untreated areas. However, the establishment of clover seedlings in areas infested by clover root weevil could be assisted by the application of a systemic insecticide at sowing. Currently, in the North Island, farmers sowing white clover into infested pasture can use short acting foliar insecticides to control adult weevils during clover establishment.

A parasitoid wasp for biological control

Microctonus aethiopoides

AgResearch has released the CRW parasitoid (a biological control agent) at numerous locations in the North Island where it rapidly became established. The biological control agent is a tiny parasitoid wasp called *Microctonus aethiopoides* which AgResearch collected and imported from Ireland.

It has since been released on farms in Nelson, Malborough, north and mid-Canterbury. North Island results indicate that the parasitoid will eventually be effective in most places.

The South Island releases have been made with funding from Dairy New Zealand and Beef and Lamb New Zealand (formerly Meat & Wool New Zealand), with logistical support from Federated Farmers, the NZ Landcare Trust, and local farmers. The CRW parasitoid has become well established at those places.

The use of biological control agents in tandem with careful management of clover will play an important role in reducing the impacts of CRW.

CRW and white clover management

- Look for the presence of CRW damage on leaves, and dig under clover plants looking for healthy pink nodules and for CRW larvae.
- **If CRW is present**, do not assist CRW dispersal by moving hay from infested areas to those that are not.
- Observe the survival and growth of clover plants in new and old pastures, to assess CRW impacts
- Review your nitrogen fertiliser policy in light of CRW, consistent with feed demand and feed supply.
- Review total fertiliser and lime policy in light of production, current soil fertility, reduced nitrogen fixation, and increased dependence on fertiliser nitrogen.
- Do not attempt to re-establish clover into CRW infested pastures by drilling or over-sowing clover seed, because adult CRW prefer clover seedlings.
- White clover seedling survival is best after full cultivation. New clover plants develop a taproot, which may be an advantage for survival in year one.
- Apply nitrogen fertiliser for the clover as well as for the grass to support clover growth and survival, especially in new pasture.
- Additional phosphate based fertiliser, lime and any other soil-additives, **will not rejuvenate clover in presence of CRW**. Re-grassing after cultivation does not have a lasting effect on CRW, as adults re-populate these areas.
- Farmers with CRW infested pastures report improved clover growth and plant survival from small but **frequent applications of nitrogen fertiliser applied year round.**

Where is CRW found in Canterbury

In Canterbury, CRW is well established but has a patchy distribution. CRW is found in the Culverden Basin, from Amberley south to Rakia Island, with a small population at the Tinwald saleyards. Currently (May 2010), no CRW populations have been found between this site and Temuka. However, CRW will eventually spread from infested areas to cover the whole of the South Island.

Summary

CRW adults

- Present throughout the year but more abundant in spring and autumn.
- Adult CRWs start to emerge in greater numbers from October onwards.
- May live several months.
- Causes “U” shaped feeding notches on leaf edges.
- The greater the number of feeding notches, the greater the number of CRW adults and the greater the number of eggs being laid in the pasture.
- Prefers the leaves of white clover but will feed on leaves of other clovers.
- CRW adults can fly and they actively disperse when numbers are high.
- CRW can survive in baled hay.
- Clover seedlings are particularly vulnerable to the CRW adult. As a general rule, sowing clover into a CRW infested pasture is money wasted.

CRW larvae

- Larvae are the most damaging stage.
- Live in the soil. The larvae, if present, will be in the top 5 cm of soil.
- Feed on the roots and nodules of clover.
- They are 1 - 6 mm long with a brown head on a white, legless body.
- Present throughout the year but more abundant from late autumn to spring.
- The smaller larvae damage the clover nodules affecting its ability to fix N. The larger larvae feed on the roots and stolons of the clover reducing production, persistence and sustainability.
- Development from egg to fully-grown larvae varies with temperature but in summer takes about 8 weeks.

Strategies for clover survival

Clover requires nitrogen to maintain growth and survive. Clover, particularly in dairy pastures, is subjected to many stresses that affect the ability of the plant to survive. CRW, particularly when new to a region, can serve as the proverbial straw that ‘breaks the camel’s back’.

Nitrogen (N) inputs for clover growth - Key Points

- When clover loses its nodules it loses the ability to fix atmospheric N.
- Clover needs N for growth.
- Clover N needs can be supplemented with bagged N. Applying “a little and often" is one approach to maintaining clover in the sward.
- Further work is required on ‘how little and how often’ but indications from North Island studies are that rates of 5 - 10 units of N/ha applied after grazing may be sufficient to aid survival.
- It is important to ensure that nutrient levels are not limiting to clover and that seasonal grazing management favours clover survival.
- These strategies do not control the pest.

“When clover root weevil first arrived on my place the clover virtually disappeared and what was left was small leafed and grew close to the ground. No good for dairy cows! Drip feeding N after grazing has got clover in my pastures that the cows can eat and with the small quantities (5-10 units of N) there is little chance of losing the N to waterways. An environmental plus!”

David Wilson -Waikato Dairy Farmer

Contact:

Mark McNeill

AgResearch 03 325 9946

mark.mcneill@agresearch.co.nz

For further information see: Clover Root Weevil http://www.agresearch.co.nz/CRW/