S I D D C
South Island Dairying Development Centre

Focus Day
Lincoln University Dairy Farm

Information Handout
8th May 2008

For further information visit:

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Ph: 03 325 3629

Next Focus Day: **3rd July 2008**
- Venue to be advised

S I D D C – Partners networking to advance South Island Dairying

Lincoln University · DairyNZ · Crop & Food Research · Ravensdown · LIC · SIDE

Programme
Will Technology Take us to a New Frontier

10.30 am	Welcome - Introduction – format for the day	Virginia Serra - DairyNZ
10.35 am	**LUDF Update**	Peter Hancox, Adrian van Bysterveldt and George Reveley (LUDF Farm Management Team)
10.55 am	Split into Groups	

Group 1 – Dark Green		**Group 2 – Light Green**	
11.00 am	Stay at Calf Shed Area Session Chair - Richard Christie - SIDDC	11.00 am	Walk to Dairy Shed – and Tanker Turnaround Session Chair – Virginia Serra - DairyNZ
11.05 am	**Reproduction Performance** Peter Hancox/Adrian van Bysterveldt	11.05 am	**Protrack at LUDF** George Reveley
11.20 am	**Breakthrough breeding technologies** Jack Hooper - LIC	11.20am	**Irrigation – Aquaflex** George Reveley
11.30 am	**Mastitis & Lameness** Adrian van Bysterveldt, Peter Hancox	11.40am	**Nitrate Leaching Results on LUDF** Keith Cameron – Lincoln University
12.00 pm	Arrive at tanker turnaround	11.55 am	Return to Calf Shed Area
	Session Chair – Virginia Serra - DairyNZ		Session Chair - Richard Christie - SIDDC
12.00 pm	**Nitrate Leaching Results** Keith Cameron – Lincoln University	12.00 pm	**Reproduction Performance** Peter Hancox/Adrian van Bysterveldt
12.15 pm	**Protrack at LUDF** George Reveley	12.15 pm	**Breakthrough breeding technologies** Jack Hooper
12.30 pm	**Irrigation – Aquaflex** George Reveley	12.25 pm	**Mastitis & Lameness** Adrian van Bysterveldt, Peter Hancox
12.50 pm	Return to Calf Shed Area	12.50 pm	Return to Calf Shed Area

12.55 pm	**The Industry Levy**	Tim Mackle - DairyNZ
1.05 pm	**Wrap Up & Thanks**	Virginia Serra
1.10 pm	**LUNCH**	LIC
1.40 pm	**Afternoon Option:** - **Farm automation developments and integration** - **Forage Crop Trials – (Shands Road)**	Garth Anderson - LIC Andrew Fletcher – Crop & Food Research
2.50 pm	Finish	

Summer/Autumn 08 Summary

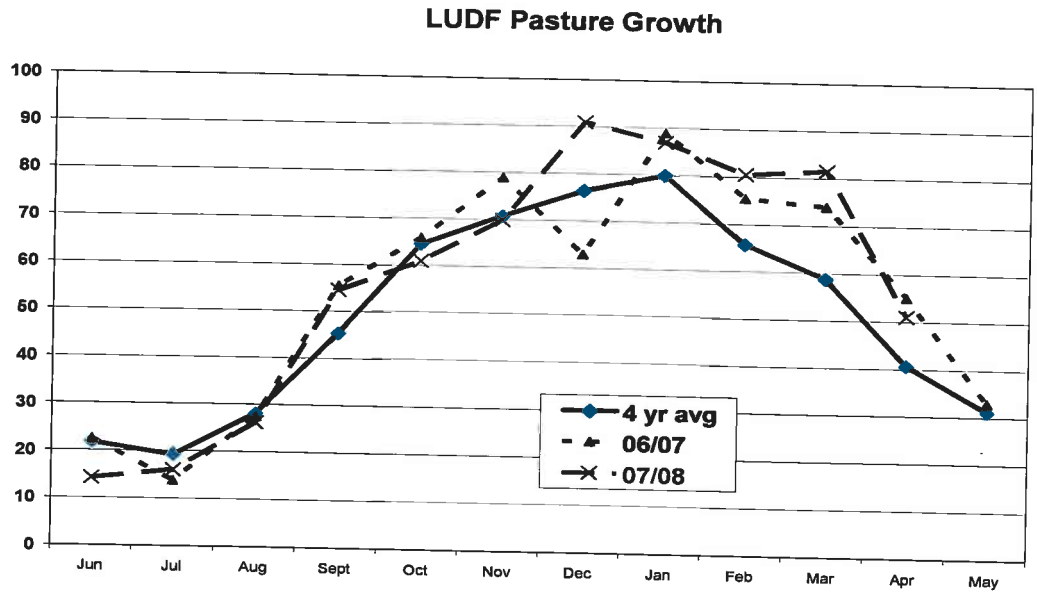
Additional Feed Purchases

We have made three additional feed purchases.

1) After reviewing last spring we decided that the 50t of "insurance" silage on hand in case of bad weather events was not enough so we have used the extra revenue this year to boost this reserve by a further 50t to a total of 100t.
2) We also reviewed our autumn feed budgets and came to the conclusion that it would be possible to eat an additional 100t of silage (150 kg DM/cow) in the autumn if it was available by maintaining cow numbers for longer. We were able to source 100t of high quality grass silage at a price of less than 5% of the payout on a DM basis at the projected payout at the time of $6.90.
3) In March when we first did our Autumn/winter/spring feed budgets after visiting our sources of wintering feed we found that there would be a deficit in August. Our investigations found that the cost of sourcing additional in August was going to be very expensive but that there was well priced surplus feed available in April/May. Our strategy has been to remove our replacements from our own runoffs to this other grazing and allow covers on our own runoffs to lift so that the feed budgets now work right through to balance date. This will affect our cost this year as it has transferred a grazing cost from next season into this season.

Pasture Growth.

Pasture growth rates this year have been very similar to in the beginning and end of last season. Slow in winter/spring and then much higher than average from mid summer into the autumn. This year growth was also much better in December .These higher growth rates have been driven by warm weather and higher soil temperatures.



Over the year we will grow even more grass than last season but the very low growth in winter and early spring did mean that we were struggling for feed through the winter and spring and the cows was restricted for longer than ideal.

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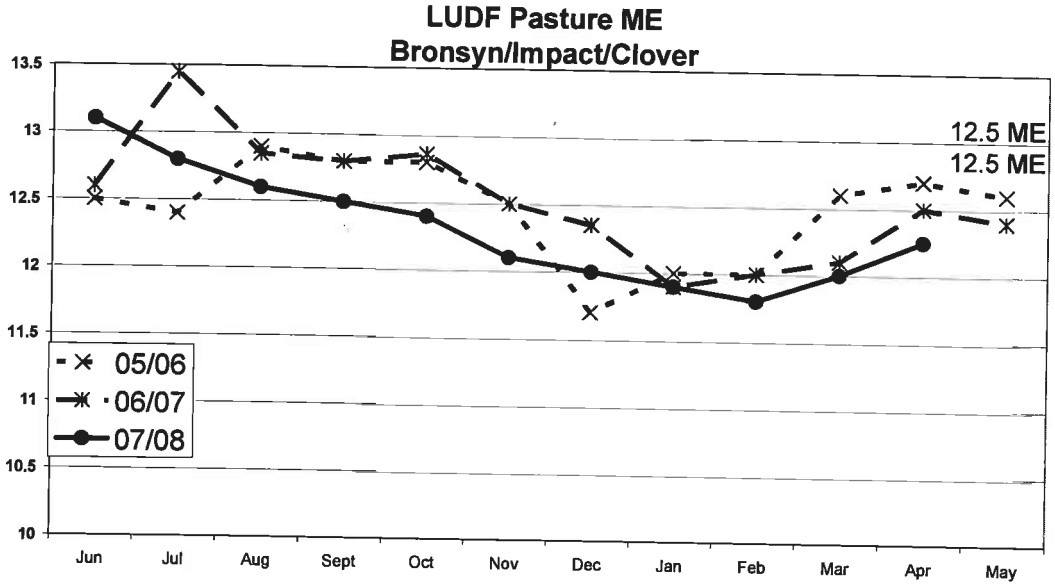
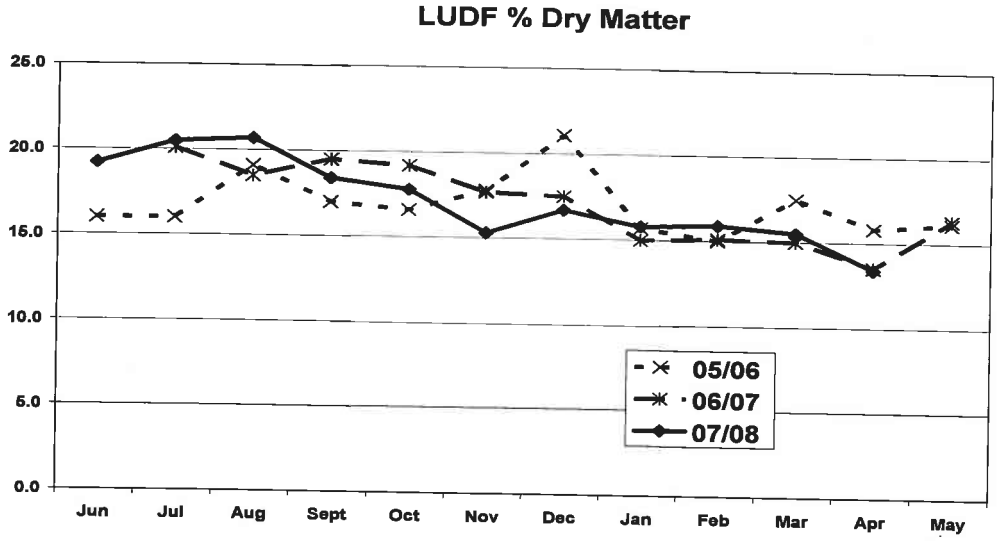


. We have had a consistently lower ME in our pre-grazing pastures this year. The difference is not large but at times has resulted in cow performance being 0.1 kg MS /cow/day less that previously achieved at that time of the year. There have been different things reducing the ME at different times of the year. These have been;

a) higher stocking rate requiring higher pre-grazing covers
b) not as aggressive removal of surpluses into silage – not farming on the knife edge of supply.
c) Warmer nights which have resulted in slightly lower sugar levels in the grass but at the same time have resulted in much higher growth rates



The sustained period of above average growth from November on into April also has resulted/coincided with a long period of lower than average % DM. The low point has occurred in April the same as last year.

Low Dry Matter %'s have their biggest impact on cow production when cows are at peak potential intakes. The impact in April will be less on MS production but may be

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impacting on Body Condition Score gain. In the last two seasons we have found that during February, March and April when our cows have been just on grass, weight gain has been very slow and milk production / cow has been lower than expected.

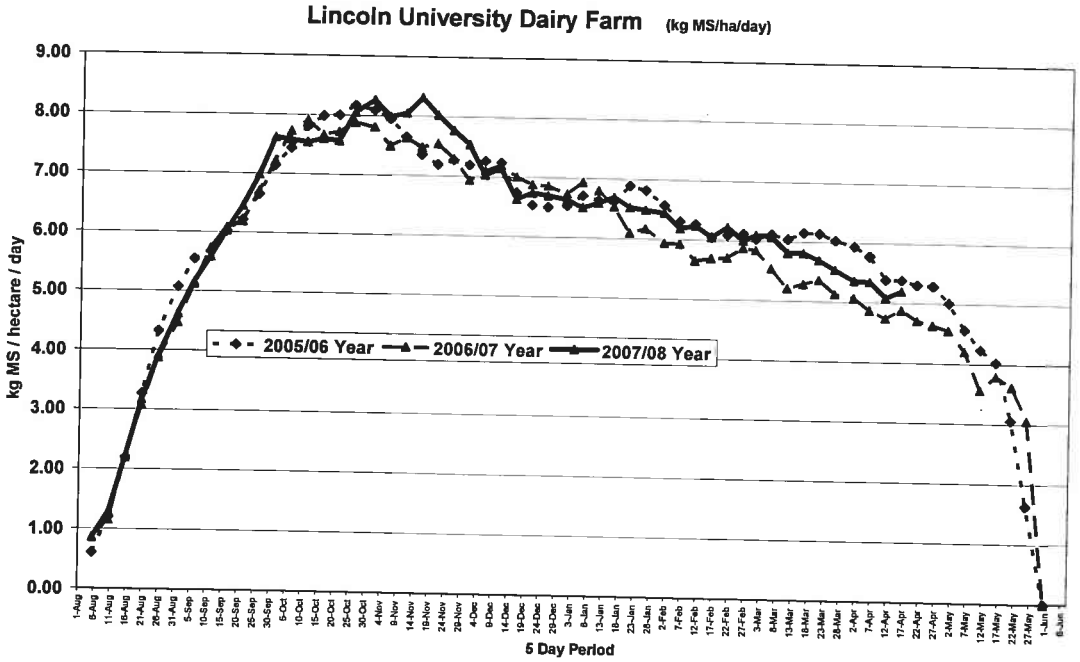
Last year we attributed this to the lower quality pasture as a result of the long rotation length (40 to 45 days) very high pre-grazing covers we were going into, but this year our rotation lengths have been between 30 and 35 days and covers have been less and we are still seeing the same effect of lower ME pasture and very slow weight gain and lower daily /cow production.

We are not sure of why this is occurring as the grass is green and leafy, with no dead matter in the base and the cows are leaving residuals between 7 and 8 "clicks" which are higher than during the rest of the season.

In effect even though there are more kg of pasture for the cows the lower ME and the lower %DM mean that there is not a lot more additional energy available for the cows.

As soon as we give them grass silage – with the cows being required to graze to 7 "clicks" we consistently observe that their production lifts and weight gain improves even though the silage is of a lower quality than the grass. This was most evident in the autumn off 2006, when we had twice the amount of silage on hand for the autumn compared with other seasons and grass growth was close to average. The cows received up to 5 kg DM /cow/day of silage and / cow production through March/April/May was the highest it has ever been.

There is no evidence of the inclusion of silage resulting in some better mix of nutritional factors but it may simply be that the combined ration or 2/3 pasture and 1/3 silage is easier for the cows to harvest.



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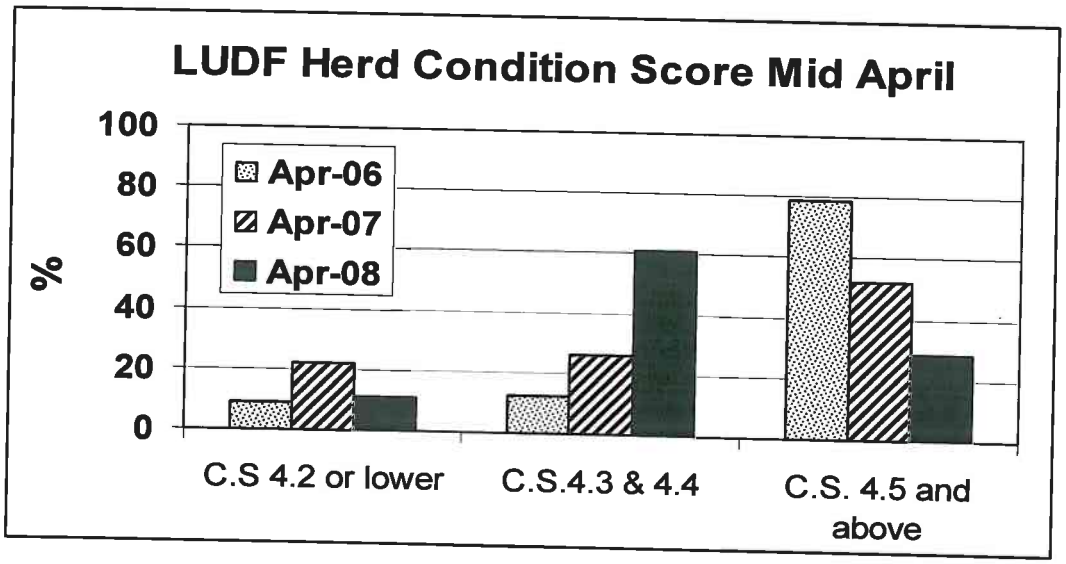
The fact that we have not yet culled or dried off the low producers because we have had such good pasture growth and have large reserves of silage still available has only a very slight effect.. At the last herd test there were about 75 cows producing less than 1 kg MS/day. With these still in the herd the average / cow will have been reduced by only a 0.03 kg MS /cow/day.

Cow wastage

Month	Reason	06/07	07/08
June	Heart failure	0	1
July	Accidental	2	0
	Milk Fever	2	0
August	Accidental	3	0
	Bloat	1	0
	Other	1	2
	Milk fever	0	1
September	Liver problems	2	0
	Bloat	3	0
	Milk fever	0	1
October	Bloat	1	0
	Milk Fever	0	1
	Johnnes	0	1
Oct to May	Bloat	7	0
	Unknown	0	1
	Broken Back (mating)	0	1
	Johnnes	0	2
Total		23	11

The 12 less deaths so far this year represent a potential profit improvement of over $18,000 so far. The 11 deaths represent a loss rate of less than 1.5 % on the total cows wintered. This is significantly better than typical for large herds.

Herd Body Condition Score



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We have less of a spread than last year but more cows below condition score 4.5. This year the most critical group (which are those with a condition score of 4.2 and less), has no cows below condition score 4.0 and only half are early calvers. Last year this group was twice as big and there were cows below score 4.0.

LUDF objective is to calve every Rising 2yr and Rising 3yr heifer in condition score 5.5, and every mature cow in condition score 5.0.

LUDF Planned Start of Calving 1 Aug. **Your Herd PSC_____**

R3yr C.S group	Cow C.S group	Dry of days required *	LUDF Early Calvers	LUDF Late Calvers	**Your Early Calvers**	**Your Late Calvers**
Below 4.0	Below 3.5	120	1April	21 April		
4.0 – 4.4	3.5 – 3.9	90	1 May	21 May		
4.5 – 4.9	4.0 – 4.4	60	1 June	21 June		
5.0 plus	4.5 plus	50	10 June	31 June		

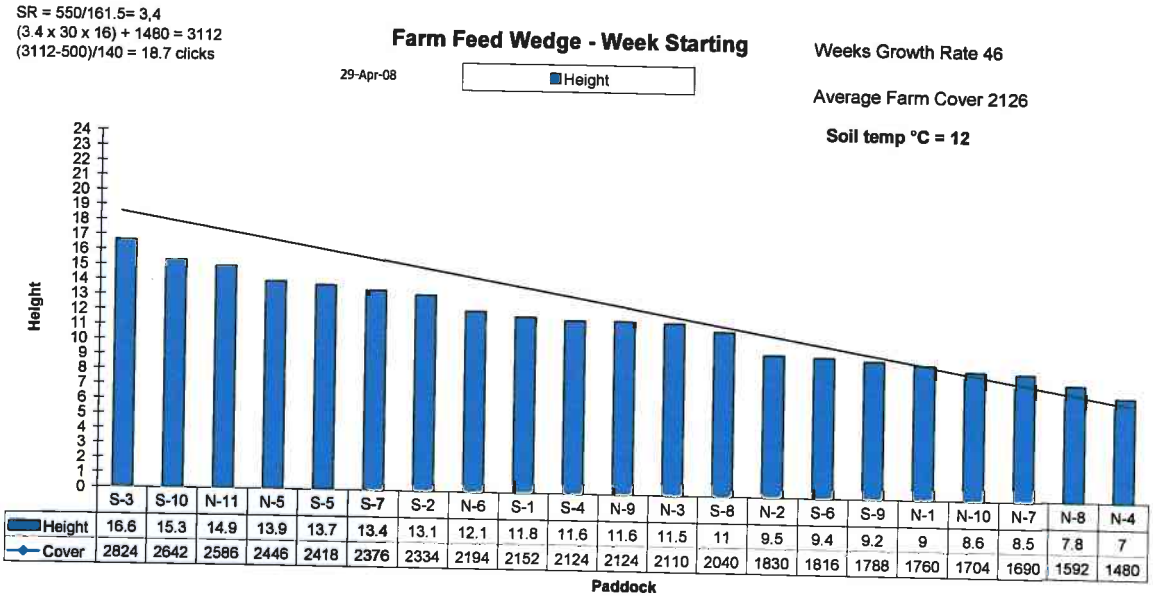
- Early calvers are due to calve in the first three weeks (about 70% of the herd)
- **There dates are the latest that these groups should be dried off. The experience of LUDF is that we can reliably get only 15 kg weight gain /month so while this table is based on that in** "Condition Scoring Made Easy" pg 32 **we have added extra days to fit our circumstances.**

This plan works out for LUDF if we have enough feed on hand and are used as the starting point in our Autumn/winter feed budget. (See Appendix for Feed Budget)

The early calving thinnest mobs will be getting the highest quality winter grazing.

Feed Wedge at 29 April

SR = 550/161.5= 3.4
(3.4 x 30 x 16) + 1480 = 3112
(3112-500)/140 = 18.7 clicks



	S-3	S-10	N-11	N-5	S-5	S-7	S-2	N-6	S-1	S-4	N-9	N-3	S-8	N-2	S-6	S-9	N-1	N-10	N-7	N-8	N-4
Height	16.6	15.3	14.9	13.9	13.7	13.4	13.1	12.1	11.8	11.6	11.6	11.5	11	9.5	9.4	9.2	9	8.6	8.5	7.8	7
Cover	2824	2642	2586	2446	2418	2376	2334	2194	2152	2124	2124	2110	2040	1830	1816	1788	1760	1704	1690	1592	1480

We have dropped cow numbers to 550 and are on a 30 day rotation feeding up to 4 kg DM of grass silage. Further cows will be dried of on condition score or as required to

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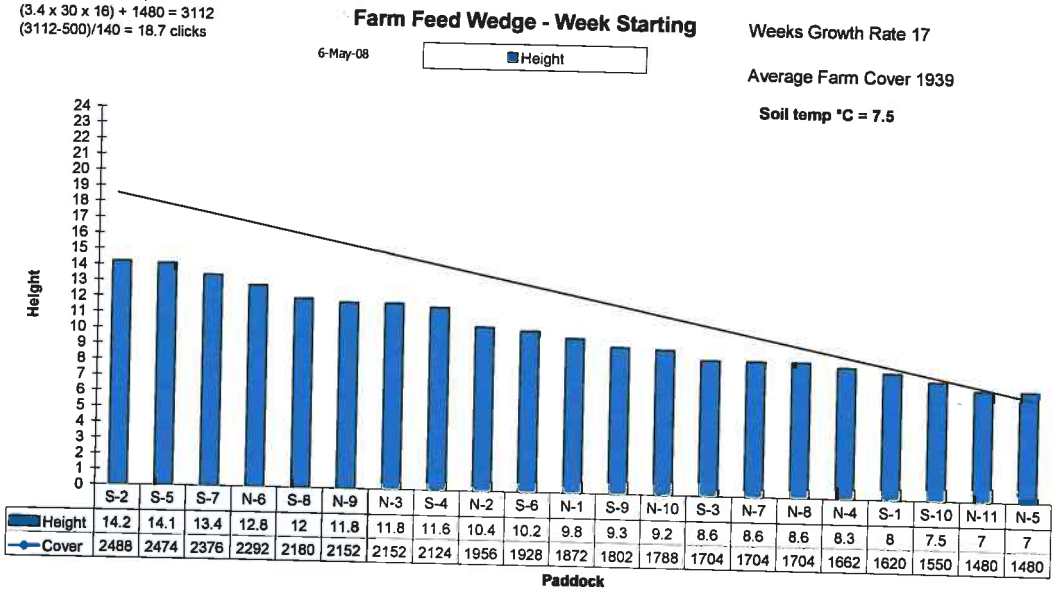
match feed demand. The plan for the balance of May (also see feed budget in Appendix) is to milk about 500 cows to the 30th May and then dry off as many as we need to meet the pasture cover targets below.

The pasture wedge for one week later at 6 May

SR = 550/161.5= 3.4
(3.4 x 30 x 16) + 1480 = 3112
(3112-500)/140 = 18.7 clicks



	S-2	S-5	S-7	N-6	S-8	N-9	N-3	S-4	N-2	S-6	N-1	S-9	N-10	S-3	N-7	N-8	N-4	S-1	S-10	N-11	N-5
Height	14.2	14.1	13.4	12.8	12	11.8	11.8	11.6	10.4	10.2	9.8	9.3	9.2	8.6	8.6	8.6	8.3	8	7.5	7	7
Cover	2488	2474	2376	2292	2180	2152	2152	2124	1956	1928	1872	1802	1788	1704	1704	1704	1662	1620	1550	1480	1480

The storm that came through on the weekend dropped soil temperatures from 10 deg to 3 deg and pasture growth dropped to 17 which is less than 1/3rd of demand. The impact on average pasture cover has been dramatic and the revised feed budget indicated that we have only just enough pasture and silage on hand to progressively dry off the herd and keep them on farm until 1 June when they go to winter grazing.

If growth exceeds our revised feed budget, we may milk the later fat cows for an extra week or two to utilise this feed, HOWEVER WE WILL NOT COMPROMISE OUR COVER TARGET BELOW.

Our cover target for:

1st June is 2050kgDM/ha
27th July is 2500kgDM/ha
30th September is 2250kgDM/ha

We aim to calve at a cover of 2500 to supports our policy of not feeding supplement in the spring. Our view is that supplement during the spring will reduce per cow energy intake, and takes up valuable time, which we would rather devote to pasture management and stock health.

The appropriate average pasture cover on your farm will differ from the target for LUDF and will be a function on your size of cow, stocking rate, rotation length at balance, and target grazing residual.

The below table shows the cover you will require at balance date to offer your cows a particular level of feed intake. At our stocking rate of 4.3 cows/ha we are targeting 16kgDM/cow at this time and a 22 day round, therefore require 2250kgDM/ha as the table below shows.

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Average Farm Cover required at Balance Date

Table 1

1) All cows calved at balance date
2) Cows graze down to 1500 kgs DM/ha
3) Rotation length 22 4.5455

Cow Intake	Stocking rate (cows/ha)								
kg DM/day	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50
13	1858	1893	1929	1965	2001	2036	2072	2108	2144
14	1885	1924	1962	2001	2039	2078	2116	2155	2193
15	1913	1954	1995	2036	2078	2119	2160	2201	2243
16	1940	1984	2028	2072	2116	2160	2204	2248	2292
17	1968	2014	2061	2108	2155	2201	2248	2295	2342
18	1995	2045	2094	2144	2193	2243	2292	2342	2391
19	2023	2075	2127	2179	2232	2284	2336	2388	2441
20	2050	2105	2160	2215	2270	2325	2380	2435	2490

Note: cow intake at Balance date will still be 2 kgs DM below peak

Note: on a wet farm allocate 1 to 2 more kg DM to allow for poor utilization.

Our wintering plan to achieve these targets is as follows:

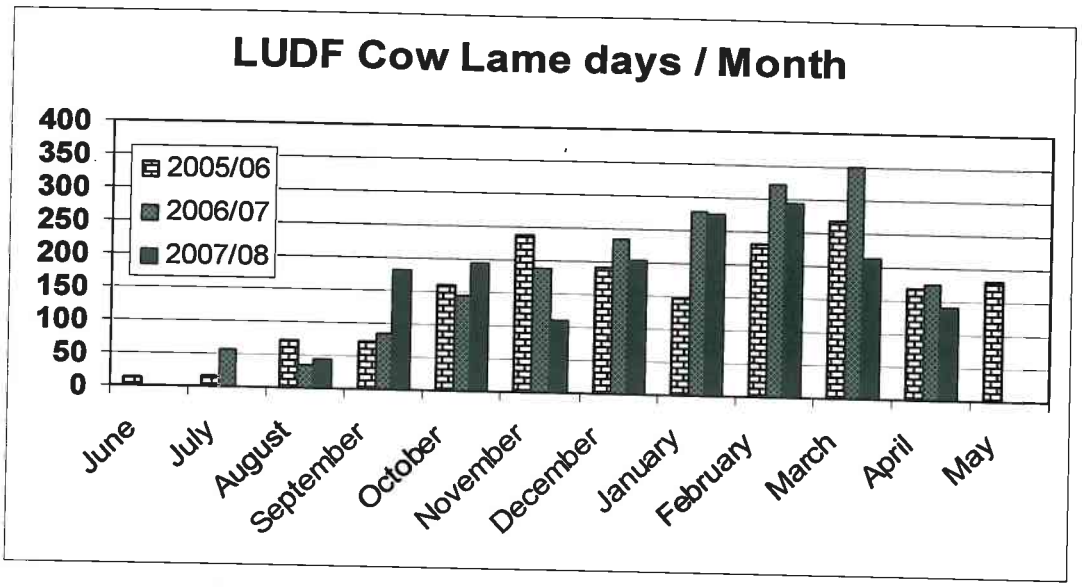
We have budgeted to graze 160 thin early calving cows on the milking platform throughout the winter. They will be fed up to 12kgDM/cow of high quality pasture. Straw is available should we need it. This mob will allow us to maintain a steep shape to our feed wedge and ensure high quality pasture throughout the first round.

The rest of the herd will go to grazing at various locations – we have opted for more graziers to spread risk.

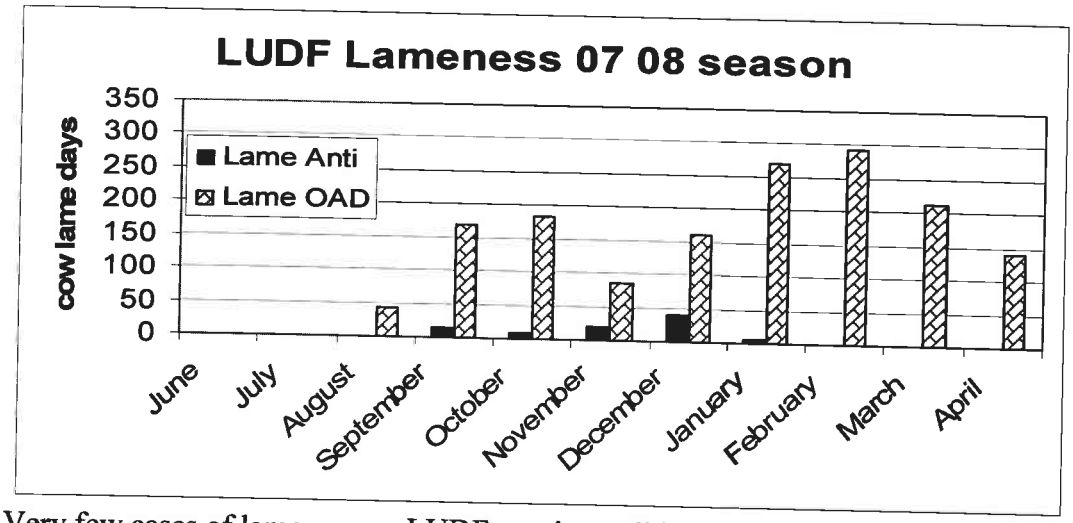
- Keypoints:
  - Have a wintering plan
  - Do a budget and know your cover targets
  - Maintain the right shaped wedge at home
  - Monitor all feed weekly and map progress towards targets.
  - Update budgets with weekly covers
  - Have options should growth at home exceed your budget and you need to bring cows home to maintain pasture quality or vice versa.
  - Mob cows according to need, early calvers and lights through to late calvers and heavies, preferentially those that need it!

Lameness Update

LUDF lameness in 06/07 occurred mostly in dry conditions. This has been put down to the state of the race surfaces. When dry there are a high number of pressure points / foot plant. During wet conditions they are softer. As a result the laneways were resurfaced although it was indicated that it was hard to justify based on the cost of doing this and the estimated low production losses (refer last May handout).



This season we had more lameness in September and October than any previous year but less over the whole season. We had had a lot of difficulty fully staffing the farm and have either been short staffed or we have had to use inexperienced casuals. We believe that the two are related as we can find no other difference between years that could account for this increase. We also seem to rise get another peak of lameness after the bulls go into the herd. Each year the bulls have been going out earlier and each year the summer lameness problem has got earlier.



Very few cases of lameness on LUDF require antibiotic treatment.

Analysis of Lameness in LUDF Herd 2006/07 (to 30 April)

Category		% of cases 07	% of cases 08
0		7	2
1	White line abscess	65	72
2	Sole haemorrhage or bruising	6	3
3	Sole Ulcer	10	3
4	Sole penetration	4	13*
6	Between the claws	6	7
7	Above the foot	1	0

* mostly occurred in February.

11.

Seventy one cows have been lame (10.5% of the herd) with 96 cases of lameness.
Eighteen cows had were treated twice but half were for a different feet
One cow was treated three times.
The average stay in the lame mob was just over 17 days and the longest was for 36 days.

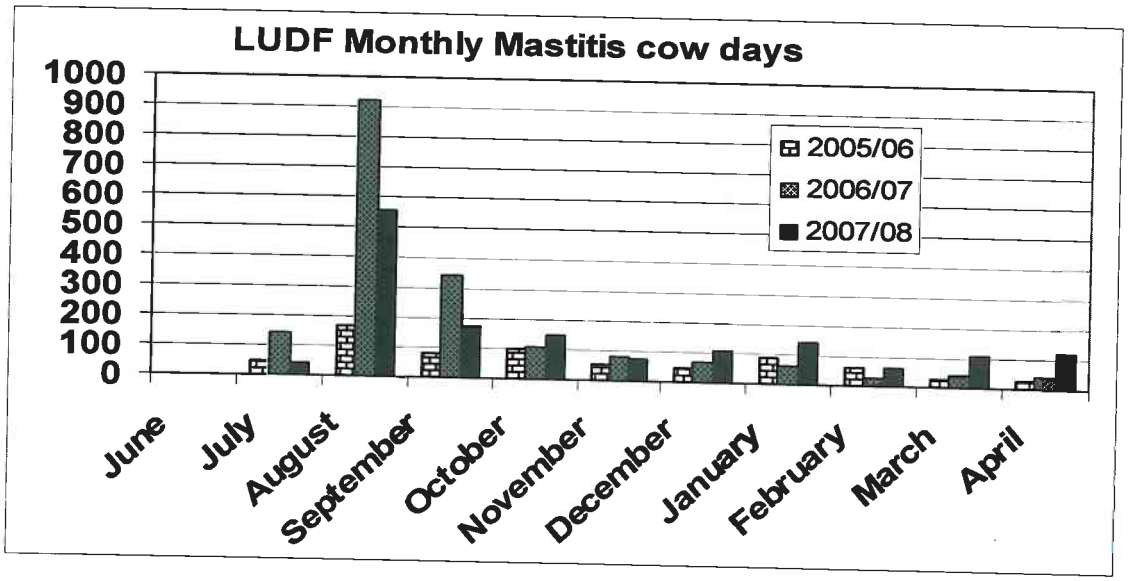
LUDF staff have completed the Healthy Hoof training program, and the current farm focus on lameness is to remove cow flow congestion points near the cow shed, get smooth cow flow onto the platform, consistent and careful use of the backing gate and top gate, timely identification and on appropriate treatment.

Production cost of Lameness on LUDF

	04/05	05/06	06/07	07/08
Cases of lameness			81 (12.5%)	
Cow lame days - OAD	1732	1589	1754	1653
Cow lame days - antibiotic	346	172	112	93
Production lost				
OAD cows 0.5 kg MS/cow/day	866	794	877	826
Antibiotic 1.5 kg MS/cow/day	519	258	168	62
Total MS lost	1385	1052	1045	888

We have lost less production from lameness this year mostly because less cows needed antibiotic treatment.

Mastitis update



We have had no cases of dry period mastitis. And because of the drier spring the number of mastitis cases was less than the previous year. The bad news is that compared with the seasons before 06/07 we have had much more mastitis. We believe that the staffing situation on farm has contributed to this and the graph of somatic cell count below show a dramatic change once the current team came together.

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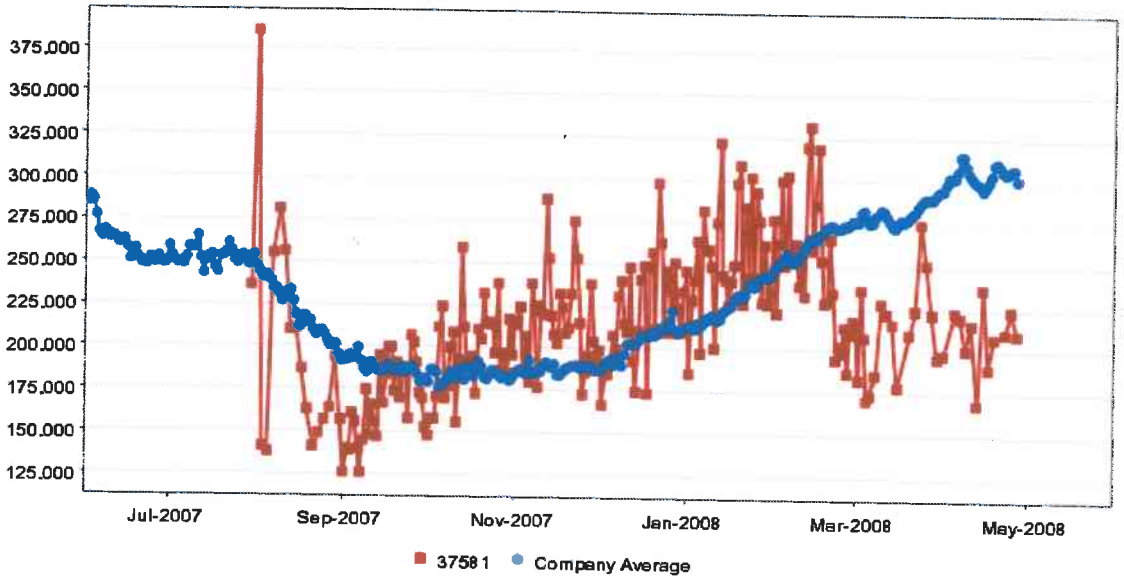
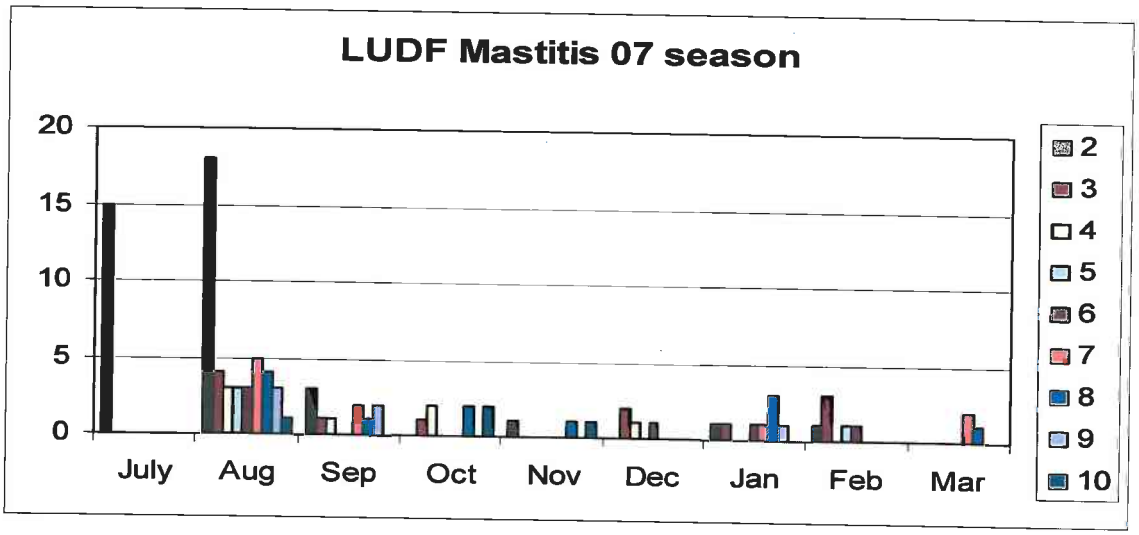


Mastitis by Age



This is the same pattern as all our other years. The single largest contributor to our mastitis problem is heifers at calving. Last year we kept the R2yr Heifers at home so that we could train them through the shed prior to calving and at the same time teat spray them several times in the month leading up to calving. Regular teat spraying of the heifers did not occur because the available staff we simply too busy shifting stock.

The main options researched for treating heifer mastitis were;

1) Identification of clinical mastitis before calving and treatment with dry cow antibiotics – resulted in cure rates of between 80 and 100%. .
2) Blanket treatment with subcutaneous penicillin (Masticillin) immediately pre-calving resulted in a 31% reduction in mastitis up to 5 weeks after calving.
3) Pre-calving teat spraying 3 times a week (for a minimum of 3 weeks). There was a 50% reduction in the number of infected quarters in the 3 weeks after calving. The trial group was not large enough to indicate if the reduction in mastitis was statistically significant.
4) Treatment with external teat sealant twice weekly only tended to reduce the incidence of mastitis post calving – data not yet published

5) Infusion of internal teat sealant 30 days prior to calving reduced pre-calving infections by 74% and post calving mastitis cases by 65%

Ref (McDougall, Compton, Parker, Weir, Heuer and Williamson – Heifer Mastitis, what causes it and what can we do about it? SAMM Milk Quality Conference June 2006)

After weighing up the pros;

- Training the heifers to the cowshed before they calved
- Having the earliest calving group already home

And considering the negatives

- Was not able to commit sufficient time to do the regular teat spraying required
- Heifers are already fat so they leave 1100 residuals which require 20 extra days of growth just to get to milking cow residuals
- Heifers are more unsettled and so are prone to do more pasture damage

We have decided that this year we are going to use option 5) and have the heifers grazing off the milking platform. This option was more effective in the trial work and has a one off time requirement but is more expensive.

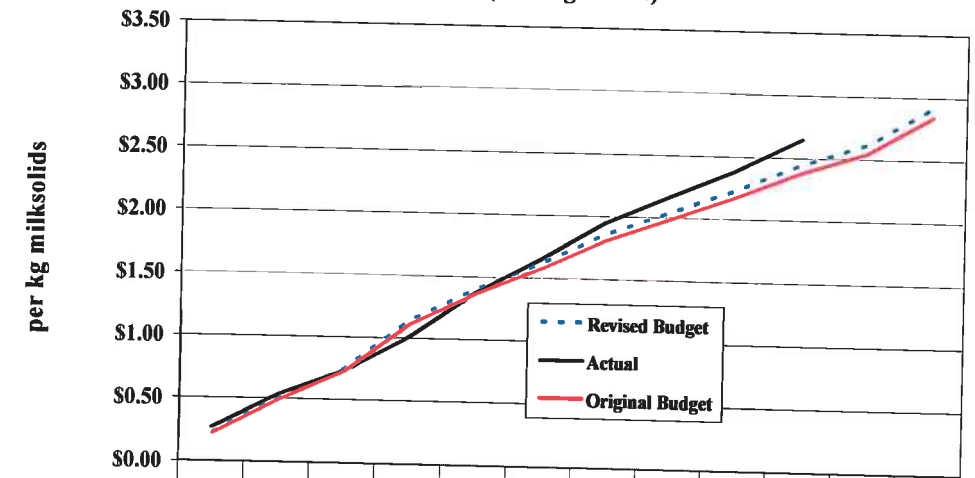
Production Losses due to Mastitis

	04/05	05/06	06/07	07/08
Cow milking days lost**	639	723	1854	1550
Average MS lost/day	2.0	2.0	1.8	1.8
Kg MS lost	1278	1446	3337	2790

** a cow milking day is every full day that a cow is in the treatment mob and its milk is being withheld from factory supply.

Financial Update

Accumulated cost of milk production Actual vs budget
(based on production of 287,000kg milksolids)
(1777 kg MS/ha)



	June	July	August	Sept	October	Nov	Dec	January	Februar y	March	April	May
Revised Budget	$0.22	$0.50	$0.74	$1.14	$1.40	$1.61	$1.85	$2.04	$2.23	$2.44	$2.61	$2.92
Actual	$0.27	$0.53	$0.73	$1.01	$1.37	$1.65	$1.95	$2.18	$2.39	$2.65		
Original Budget	$0.22	$0.49	$0.72	$1.11	$1.36	$1.57	$1.81	$1.99	$2.17	$2.38	$2.54	$2.84

Costs have been held to within 14% of the original budget.

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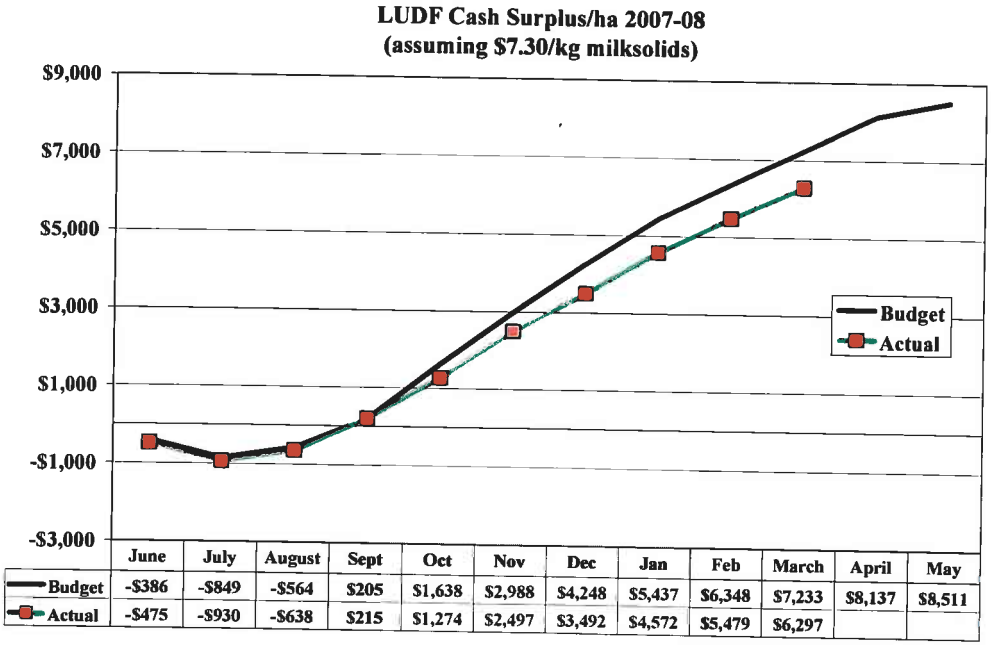


	June	July	August	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May
Budget	-$386	-$849	-$564	$205	$1,638	$2,988	$4,248	$5,437	$6,348	$7,233	$8,137	$8,511
Actual	-$475	-$930	-$638	$215	$1,274	$2,497	$3,492	$4,572	$5,479	$6,297		

Last years final EFS (profit) was already passed by the end of December this year. There is still a large amount of income to come from surplus stock sales to come in May which will result in the actual profit graph getting much closer to the budgeted profit.
The final graphs will change slightly depending on the final production result of the farm.

RoMP dexcel planning for pregnancy

Dairy herd repro chequer

You will need:

- Your current Yellow Calving Notebook

1. Your Calving Pattern

Herd Size (as at 1 July) 2006 **680** 2007 **680** yours _____

	LUDF 2006	LUDF 2007	Yours	How to find this figure
Your Planned Start of Calving (PSC)	31 July	27 July		*From Expected Calving Order. If you are mating your heifers before your cows, use the PS date of the cows as your PS date.*
Date of mid point of calving	12 Aug	12 Aug		*This is the date by which half the herd has calved, i.e. for a 300 cow herd the date on which the 150th cow calved. Include heifers calving. Source Yellow Calving notebook (calving date order)*

	Target	LUDF 2006	LUDF 2007	yours	How to find this figure
Days PS calving to midpoint	**14 days**	12	16		*From yellow calving notebook*
4 week calving rate. % calved by 4 weeks after PSC	**70%**	72%	66%		*Cows calved by 4 weeks / Total cows x 100 / 1 = % calved*
8 week calving rate. % cows calved by 8 weeks after PSC	**95%**	92%	89%		*Cows calved by 8 weeks / Total cows x 100 / 1 = % calved*
Inductions: Number of cows induced	**< 5%**	0%	0%		*Cows induced / Total cows x 100 / 1 = % induced*

2) Cows likely to be Reproductive Risks. (Target total <15%)

NB: It is possible that some cows will be counted in two or more boxes.

All Induced Cows	**<5 %**	0%	0%		*Cows induced / Total cows x 100 / 1 = % induced*
Cows calved less than 30 days before mating starts (incl late inductions)	**<2%**	9%	7%		*Late calving Cows / Total cows x 100 / 1 = % Late*
Assisted calvings, vaginal discharge, twins, retained membranes	**< 5%**	5%	4%		*Cows calving problems / Total cows x 100 / 1 = % problems from calving*
Cows who had metabolic problems (milk fever etc)	**<3%**	1.5%	2%		*Cow with problems / Total cows x 100 / 1 = % metabolic problems*

3) Mating Evaluation 2006

Use this page to analyse and review this year's mating performance.
You will need
Mating records eg Dairy Mating Chart, AB book, Minda Pro, Dairy Win Reports

	2006	2007	your
Mating Start Date:	19 Oct	25 Oct	_____
Herd Size: (as at PSM)	680	680	_____

	Target	LUDF 2006	LUDF 2007	Your herd	How to find this figure
% of cows cycling before planned start of mating	**>70%**	73.4 %	87 %		From any pre mating heat records. Cows that have shown oestrus before planned start of mating
Number of Non Cycling cows treated as % of herd	**< 20%**	1.7% e 10.6% I	8% e Cidr 5% I ovsyn		All Non cycling cows that were treated to promote oestrus. It is recommended that you note the ages of these cows and determine if there is an age group problem.
3 week submission rate %	**>90 %**	88%	88%		Number of cows mated 21 days after start date as a % of total cows. Source From: Mating Chart, Insemination certificates, LIC Mating Reports
6 week submission rate %	**> 98 %**	100%	99%		Number of cows mated 42 days after start date as a % of total cows. Source From: Mating Chart, Insemination certificates, LIC Mating Reports
Days of AB mating period	**42days**	63	63		The shorter the AB period the greater the requirement to increase the number of bulls for natural mating. Also less opportunity for rearing of suitable replacement calves.
Days of natural mating	**42days**	42	42		Lengthening the mating period will result in slightly lower MT rates. Successfully integrating these late calving animals into a profitable farming system will always be a challenge.
Number of bulls used for natural mating	**1:30 MT cows**	1:15	1:10		Allow a minimum of one bull for every thirty non pregnant cows and more if synchrony of oestrus has occurred
% of herd preg after 3 weeks confirmed by PD	**> 53 %**	44.5%	Na %		Cows preg by 3 weeks / Total cows x 100 x 1 = % pregnant by PD
% of herd preg after 6 weeks confirmed by PD	**> 80 %**	69%	71%		Cows preg by 6 weeks / Total cows x 100 x 1 = % pregnant by PD
% Cows confirmed as not in calf after 9 weeks of mating	**<10%**	24%	24%		Cows confirmed as MT by pregnancy diagnosis. Cows calving after this will have less than 3 weeks before PSM
% Cows confirmed as not in calf after 12 weeks of mating at Feb PD	**<5%**	14%	14 %		Cows confirmed as MT by pregnancy diagnosis. Cows calving after this will have less than 1 week before PSM unless mated to Short Gestation Bulls

Reproduction

Progress to date. LUDF Calving / Mating data comparison

Season	02/03	03/04	04/05	05/06	06/07	07/08
Days to mid (all herd)		22	23	14	12	16
Days to mid (cows only)		22	23	22	16	22
4 wk calving rate %	64	63	61	69	72	66
% still to calve 1 month PSM	14	17	12	12.6	9	7
% treated as Anoestrus		36.7	24.3	14.5	17	8
% incalf at **12 weeks**	84	83	79.5	84	86	86
% MT at **12 weeks**	16	17	20.5	16	14	14*

- ***at end of Feb PD**
- **At the end of April PD we found that the herd had lost a further 11 pregnancies so now the MT % is 15.6%.**

Also Refer to Repro Chequer (Appendix)

The repro chequer clearly shows that while our MT % last year was an improvement the rate of calving this season was less than target and less than we have achieved at the previous calving.

Our 4 week calved % had dropped from 72% to 66% and our 8 week calved % had dropped from 92% to 89%. This was partly due to 25 lost pregnancies from cows originally confirmed in calf in the first 3 weeks. Most of these cows got in-calf again by the 12th week of mating and so end did not reducing the 12 wk in-calf rate which ended up at 86%.

Our 4 week calving rate was also influenced by the use of CIDR's with cows who had pre-mating heats but had not cycled in the first three weeks. In previous seasons these cows were blanked treated with a CIDR. This means that if she was going to cycle anyway that cycled will be delayed by 10 days until the CIDR is removed. Last year the timing of this CIDR intervention meant that cows treated in this way ended up being mated to calve in week 5.

This year we used two strategies for non-cycling cows.

1) Cows not cycling before the start of mating but calved more than 30 days all got the new CIDR treatment program which was timed so that they were mated on the first day of mating.
2) Cow who had a pre-mating heat but then had not had an observed cycle in the first 3 weeks of mating were treated with the OvSynch program.

All of the cows that initially lost pregnancies early in the mating last season have got in calf this season and none have lost their pregnancies a second time.

This year we have had a similar number of cows (29) who have lost their pregnancies during mating. However these have occurred between weeks 9 and 12 of mating and so all these cows are still MT.

How does LUDF calculate its In-calf and MT %s?
Peak cows milked and also at the start of mating = 680
Number of cows at time of Pregnancy Diagnosis = 650
Number of cows found to be in-calf at February PD = 585

LUDF management team method – same as Repro Chequer

$$\frac{\text{Cows Pregnant by 12 weeks}}{\text{Total cows}} \times \frac{100}{1} = \%\text{ pregnant by PD}$$

(585 /680) x100 = 86% which means that 14% must be empty.

This method assumes that all the cows that were not in-calf at the PD will have been MT including the 30 cows that we at the start of mating but were no longer in the herd at the February PD.

Common farmer methods
1)

$$\frac{\text{Cows found to be MT at PD}}{\text{Cows at PD}} \times \frac{100}{1} = \%\text{ MT}$$

(65 / 650) x 100 = 10% MT

2)

$$\frac{\text{Cows found to be MT at PD}}{\text{Cows at start of mating}} \times \frac{100}{1} = \%\text{ MT}$$

(65 / 680) x100 = 9.5% MT

The last method assumes that all the cows that were at the start of mating but are no longer there at the PD were in-calf.

If you calculated your MT% in the same way as LUDF what would it be?

The new Fertility Focus report that is part of the InCalf project will standardise how farms are benchmarked. This repost will be able available in the coming year (after Minda 7 upgrade) will give you three numbers about your herd empty rate. One is the most optimistic calculation of the herd empty rate, another is the most pessimistic calculation of the herd empty rate and the last is the best estimate given the information entered into Minda. This report will also change it target in-calf rate depending on the length of mating for your herd.

LUDF experience with the new CIDR program at 08 mating.

53 cows treated with the intervention, all 10 days prior to the start of mating of the herd. Ten of these cows were from the first group dried off last year based on condition score (73 early calving lights) and 9 out of these 10 were 2nd calvers.

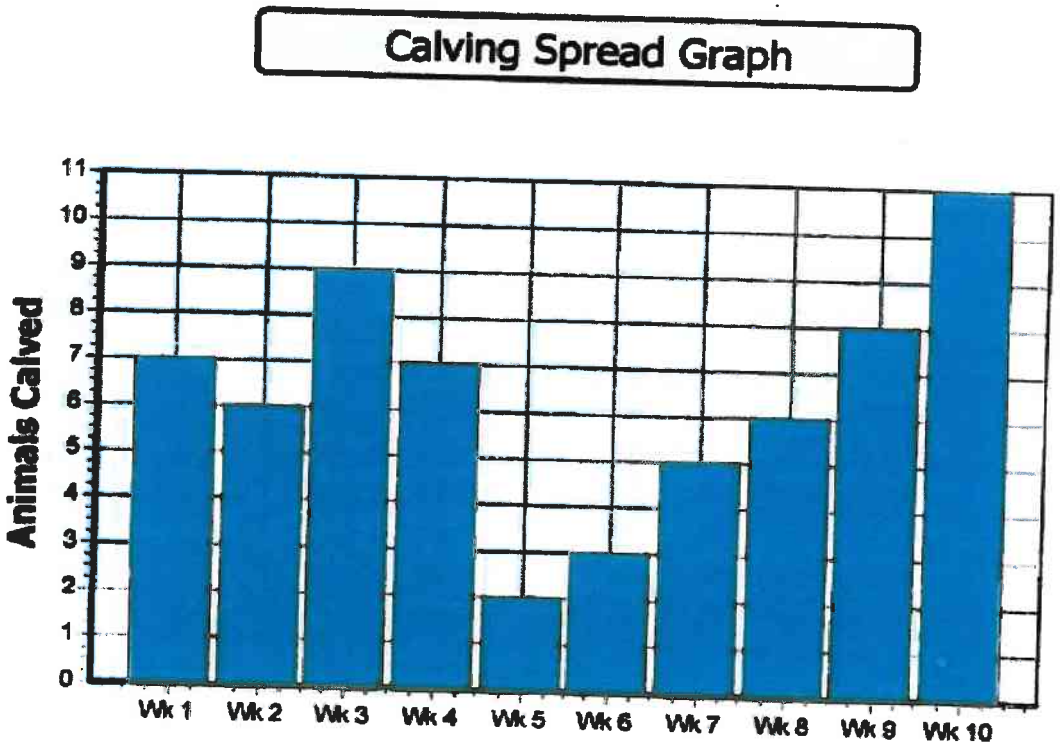
Age group	Total number	No Treated	% treated	% MT
1st calvers	153	9	5.9	0
2nd calvers	149	19	12.7	10.5
3rd calvers	103	8	7.7	0
4th calvers	88	12	13.6	16.7
5th calvers	38	3	8	0
6th calvers	53	2	5.6	0
older	100	0	0	na

On LUDF even though we were treating anoestrus cows some of which had only been calved a month, we got a very good result for early interventions with an overall Empty % of less than 8%.
The 50 late calving cows came into heat without the need for intervention.

Last seasons early calving light cows.
These were dried off at the end of April last season and then had problems with ryegrass staggers. They did not get to their target condition scores at calving and have appeared in the anoestrus group at twice the rate of the rest of their herd mates. Despite this 93% have got in-calf which is better than the herd as a whole.

Details about our MT cows.

1) Time of calving



Generally the MT cows came from the first 4 weeks of calving as much as the last 4 weeks of calving.

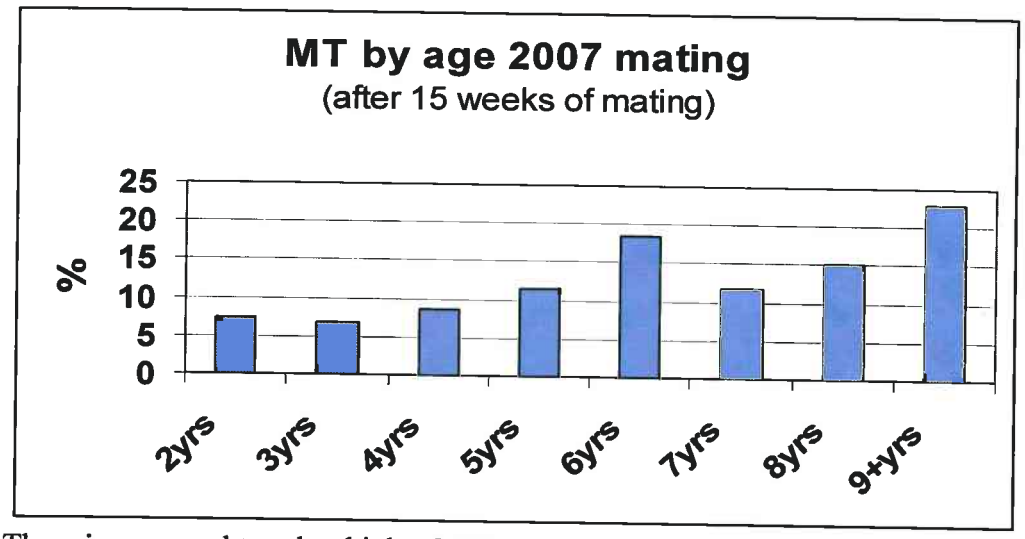
20.

2) Time of first mating

Weeks 1, 2 or 3	77%
Weeks 4, 5 or 6	20%
Weeks 7, 8 or 9	3%

All were first mated in the 9 weeks of AB with most having their first mating in the first three weeks.

3) Age analysis



There is a general trend to higher MT% in older age groups. This is consistent with what we see in the calving rate graph which shows each older age group having a calving rate graph that is further and further away from the target line.
See Appendix – Calving Rate Report

4) Weight loss/gain and other health during the mating period.

We are able to use our walk over weighting, Pro Track and Minda to compare the record of weight of three groups.
a) all the milking cows, b) the cows that had lost pregnancies and c) the empty cows.

In the 130 days from the end of September (a month before mating) to the end of January each group had gained 25 kg, 21 kg and 22 kg respectively.
The pattern of weight gain was also very similar with some periods of almost no weight gain followed by others of greater weight gain. No group actually lost weight during this period although within all three groups cows lost or gained weight at any of the 4 individual weight recordings.

The cows that lost pregnancies or were empty also had the same rate of lameness and mastitis as the rest of their herd mates.

All the cows who have lost pregnancies have had blood samples analysed for Neospora and BVD. All have come back negative for Neospora and a small minority have come back with a positive for BVD but the analysis shows that this was not because of a recent infection but rather because of an exposure to the virus some time as younger animals.

2DA

Bulls
Bulls were run with the herd after 9 weeks of AB. The ratio was 10 non-pregnant cows to each bull and the bulls were split into two teams and were changed daily. Over the 6 weeks that the bulls were with the herd they managed to get less than 50% of the non-pregnant cows in-calf.
This means that the bulls were less effective than the humans had been earlier in the season and also were no more effective than humans had been in earlier seasons when AB mating had continued for up to 15 weeks.
The bulls were not fertility tested but these same bulls were used on the heifers for 9 weeks of mating and this resulted in 96% in-calf.

LUDF going forward

At calving
Calve all Rising 2 and Rising 3 yr heifers in condition score 5.5
Calve all mature cows in conditions score 5.0

At mating
R2yr Heifers
Synchronise and mate one week before the start of mating for the herd.
Mate heifers to easy calving Jersey so that they recover quickly from calving

Improve Submission Rate
Reduce calving spread to 9 weeks as quickly as possible without inductions
Treat anoestrus cows early – 10 days before start of mating.
Make sure that cows are getting over 200 ME/day leading up to and during mating and are getting sufficient Mg supplementation.
Have the most skilled person at identifying cycling cows relieved of almost all other duties so they can concentrate solely on this job.
Eliminate missed cows due to drafting errors.

Improve Conception Rates
Cross breed with PSS to get a FxJ herd.
Eliminate cows calving after 9 weeks so that as many cows as possible have cycled at least once prior to the start of mating
Metri-check the whole herd prior to mating.
Make sure that the timing of mating is correct.
Use bull teams with higher Fertility BV's
Make sure that AB technician semen handling techniques are correct.

Changed Pregnancy testing and improved bull mating recording
In the past we have been scheduling pregnancy tests for reasons such as trying to find out when pregnancy loss occurs etc. At that time we were still struggling with needing to mate for 12 or 15 weeks to get enough cows in-calf. This has changed and we now wish to be able to progressively get the calving spread down from 12 weeks to 9 weeks so that we eliminate the cows calving within a month of mating. This should result in improved submission rates and improved conception rates. Research by DairyNZ shows that an improvement in submission rate and conception rate by 5% results in an 8% improvement in the 6 week in-calf rate and a 3 % reduction in the final MT rate.

This season we did pregnancy scans to confirm pregnancies at 6, 9, 12 and 15 weeks with AB mating going 9 weeks.

At 9 weeks we have 514 cows in calf and by 12 weeks we have a further 61 cows in calf but we as bull matings were not observed or recorded on a daily basis we do not know which of the cows are in-calf as a result of a mating in weeks 10, or week 11, or week 12. We only need half these cows to make up our required numbers for next season and the simplest way to manage this would be to induce the 34 cows we would select from the 61 in-calf between week 9 and 12.

Out options are after continuing with AB for 9 weeks are;

1) Assign staff to observe and record daily bull matings through weeks 10,11 and 12 and then confirm with the usual 12 week PD.
2) Extending AB to 11 or 12 weeks but using short gestation bulls from week 8.
3) Not observe and record daily bull matings but then PD to confirm pregnancies by PD. Ie do PD's to confirm in-calf to week 9, 10, 11, 12, and then use the late April PD to find those who are in-calf after week 12 and those cows who are no longer in-calf to and earlier mating.
4) Or bring in a higher number of replacements (200 instead of 160) so that we can sell any cow that has got in-calf after the 9 weeks of AB mating.
5) Or bring in a higher number of replacements (200 instead of 160) and do not tail off with bulls and then sell the resulting empty cows.

The options move progressively from most work and least cost to least work and most cost.

21A

Calving Rate Report

LIC

Date: 22/04/2008

C/O The Manager (University Dairy Fa
PO Box 94
Lincoln University 7647

Planned Start Of Calving (PS): 29/07/2007
PTPT Code: BQCY
Herd Code: 6/114

Animals Included: 649 **Group:** Cows in Milk **Current as at:** 22/04/2008

Calving Rates by Age Group

	Weeks Since Start of Calving										
Age Group	<PS	1	2	3	4	5	6	7	8	9	10+
2005 Born	48 %	59 %	77 %	80 %	84 %	88 %	91 %	95 %	99 %	100 %	100 %
2004 Born	10 %	26 %	40 %	56 %	68 %	72 %	78 %	84 %	87 %	90 %	100 %
2003-1999 Born	9 %	23 %	37 %	50 %	56 %	66 %	74 %	81 %	86 %	91 %	100 %
<1998 Born	3 %	13 %	39 %	45 %	55 %	65 %	68 %	68 %	87 %	87 %	100 %
TOTAL	**18 %**	**32 %**	**47 %**	**58 %**	**65 %**	**73 %**	**79 %**	**84 %**	**89 %**	**93 %**	**100 %**
Targets		19%	39%	55%	67%	75%	87%	91%	95%	98%	100%

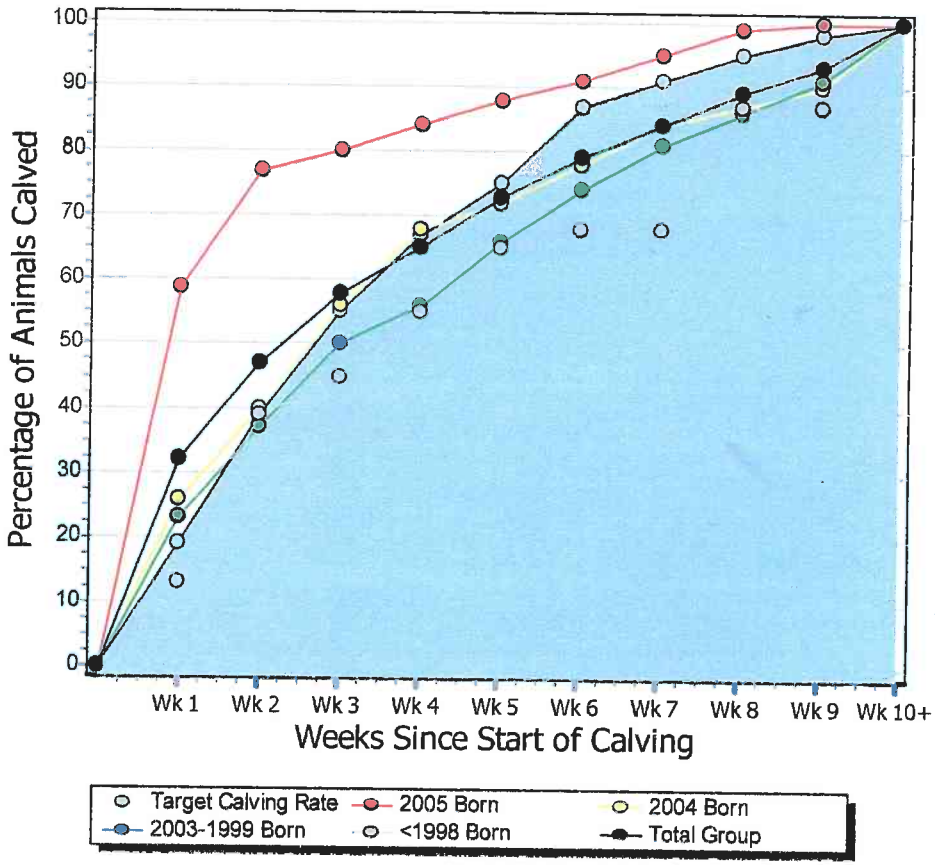
Mean Calving Date: **19/08/2007**
Date of Mid-point of Calving: **13/08/2007**
Days from PS to mid-point: **15** (Target: 14 days)

Calving Rates by Calving Type

	Weeks Since Start of Calving											
Calving Type	<PS	1	2	3	4	5	6	7	8	9	10+	Total
Normal	118	88	101	71	47	47	39	36	33	22	47	649
Induced												
Premature												
Abortion												
TOTAL	**118**	**88**	**101**	**71**	**47**	**47**	**39**	**36**	**33**	**22**	**47**	**649**
Accumulated	118	206	307	378	425	472	511	547	580	602	649	

Percentage of Cows Induced: **0.0 %** (Target: <5%)

Calving Rate Graph



MINDApro

Protrack @ LUDF

Cow identification and drafting system at LUDF incorporating a Gallagher walkover weigher

The system began use in Spring 06
Use this season 2007 - 08 has seen the system become a lot more integrated into the weekly management than in it's first season.

The team have used the system regularly throughout the season to draft cows and locate cows to check for a sore foot or a potential mastitis infection The audio alert has been used to indicate three titter cows and cows with herd test high somatic cells.
During calving and leading to mating the information on days since calving and the pre mating heat were used regularly to interpret where a cow was up to and make judgements about vet checks and hormone assistance to cycle.

During calving time the system was used to draft calved cows from springers on many occasions with the added benefit of a teat spray at the same time for the springers.
The impact on milk production from sore feet in the herd has been reduced a little this season due to less antibiotic use which reflects both positively on the training from the Healthy Hoof team and the ability to draft cows the day they are seen to be becoming sore.

Return on the investment
How do you put a value on the "I would not like to manage the herd without one now" comment from Peter and the time that he and the herd manager have not had to spend finding cows and have therefore had better energy to apply to managing other aspects on that day.
The spreadsheet (attached) shows an analysis of use and applies value to the gains from that. Gains to milk production have not been estimated apart from the effects with lame cows and cows mated on time.
The spreadsheet shows that an annual loss of $3,253 occurs before any gained milk production per cow is attributed to the system. A simple gain of 1 kg of milksolids per cow from sharper use of feed or cow management during time otherwise spent finding cows etc generates a break-even position and any more gains begin to pay it off.

Walk over weighing
This system works away in the background and we generate reports each week to view the progress of the herd and from time to time look at which cows are losing weight. The weight loss cows are frequently cows that have had sore feet or mastitis. Recently some cows with damaged feet but not lame were picked up by drafting cows with recent significant weight loss but no obvious sign of sore feet – this pro-active location and treatment of lame cows is a key target for us.
Report
Weight gain and loss across the month

			04/04/2008	11/04/2008		18/04/2008		25/04/2008		02/05/2008		Whole Period (35 days)		
Animal ID	Year Born	Breed	Avg Weight * (Kg)	Avg Weight * (Kg)	Change in Avg Weight	Avg Weight * (Kg)	Change in Avg Weight	Avg Weight * (Kg)	Change in Avg Weight	Avg Weight * (Kg)	Change in Avg Weight	Change over Period (Kg)	Daily Change (g)	Total Number of Weights
708	2001	F10J6	495 (14)	513 (13)	18	510 (13)	-3	514 (14)	4	516 (13)	2	+21	+750	67
709	1999	F13J3	547 (13)	557 (14)	10	544 (12)	-13	551 (13)	7	553 (12)	2	+6	+214	64
710	1998	F	585 (14)	593 (14)	8	596 (13)	3	604 (14)	8	615 (13)	11	+30	+1071	68
711	2003	J8 F2	497 (14)	490 (5)	-7									19
713	2001	F10J6	564 (14)	568 (13)	4	574 (13)	6	559 (13)	-15	581 (13)	22	+17	+607	66
714	2000	F	619 (6)	628 (6)	9	639 (13)	11	641 (11)	2	672 (13)	31	+53	+1893	49
715	2003	F12J4	530 (14)	525 (5)	-5	532 (7)	7	547 (14)	15	557 (12)	10	+27	+964	52
716	2001	F	484 (14)	492 (14)	8	494 (13)	2	494 (13)	0	493 (12)	-1	+9	+321	66
718	2001	F9 J7	585 (14)	579 (14)	-6	595 (13)	16	591 (14)	-4	582 (11)	-9	-9	-107	66
Averages			482 (13)	486 (13)	4	490 (13)	4	490 (13)	0	495 (11)	5	+13	+461	63

This weight data helps provides confidence and opportunity for more responsiveness than typical condition scoring will do.

Summary

LUDF had a very high level of cow management before Protrack was installed. The level of cow management has increased and the system is demonstrably close to breaking even as an investment. The team would not like to operate without the responsiveness that the system allows. Being directly linked to MINDA is of considerable benefit.

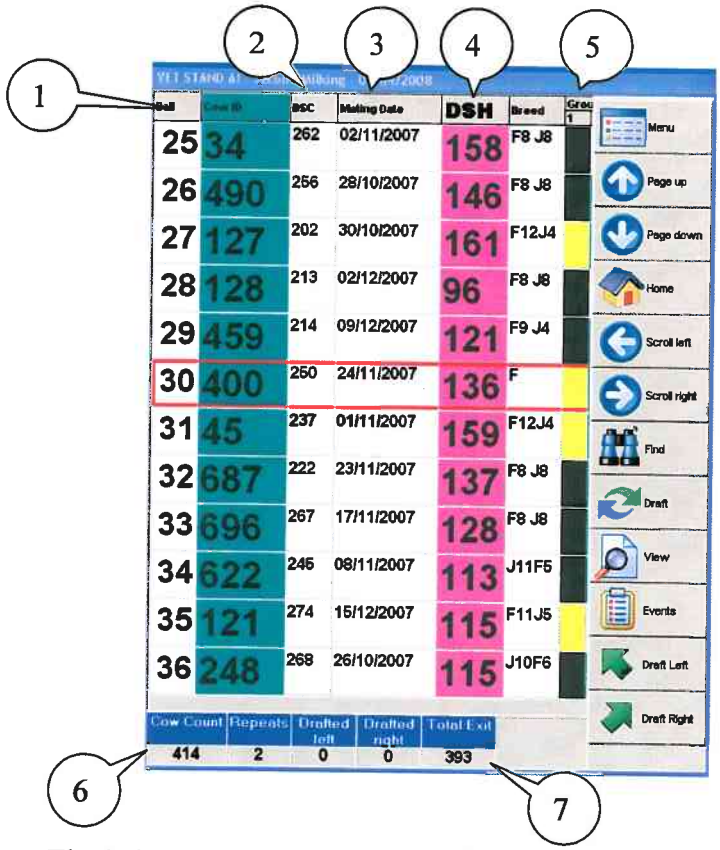
In larger herds or where the herd is normally split there are naturally greater opportunities to gain advantages around managing the herds and having the right cows in the correct herd.

The future

If automatic cup removers are added automated drafting becomes an essential part of the overall system.

Protrack screen as used during mating

This is the one used at the Vet stand and where the AI is carried out.



1 The bail number where the cow is

2 The days since the cow calved

3 The most recent mating or heat date

4 The days since the most recent heat

5 The herd was grouped into those to be mated to Friesian and those to Jersey denoted by black and yellow

6 Cows milked to date (during a milking)

7 Cows that have gone past the exit reader at this point in the milking

PROTRACK @ LUDF
Analysis of likley costs and returns

May-08

Costs

Capital

	ProTrack	Peak cows 680
Hardware	$55,000	
Installation	$5,000	$75,200
Electrician etc	$5,000	
Engineer - pipe and yards	$6,000	
Upgrade for phone connection	$800	
tags @	$5.00	
Capital Cost per cow		**$111**

Running costs

R & M per annum including any upgrades		$1,500
Replacements tags		$680
Depreciation	12 yrs	$6,108
Interest on Capital	9.4%	$7,069
Total annual cost		$15,357
Cost per cow /yr		**$22.68/cow**

Benefits and efficiencies

Typical milking time in hours 2.25

Staffing saved

Herd Testing		**hrs/event**	**events**	**value/hr**	
			8	$20	$360
Drafting					
Mating - cows for AB	No staff saved		0	$20	$0
Finding cows for vet inspection/treatment	Staff saved		15	$30	$1,013
Sorting springers	Used regularly for about half the period - cows calve on East Block.	1	15	$20	$396
Colostrum cows records and info on screen	Cows into silo promptly and helpful data	0.2	70	$20	$280
Having the days since calving number on screen	Very helpful when deciding on treatments post calving and at mating time	?	many days	$30	
Finding Cows to be dried off			5	$30	$338
Locating Cull cows			3	$20	$135
re-locating the sore foot cows when mixed with the main herd - saves time during the milking		0.2	80	$20	$320
Correctly identifying the treatments number - completeion etc.	Some drugs probably saved.	0% of milking time	0	$30	$0
Re finding treatment/suspect cows for inspection/follow-up	Not used much		0	$20	$0
					$2,841
					$4.18/cow

Milking efficiency

Milking time set efficiently	1.0 seconds/cow		650	$20	**$2,094**
Total handling "gains"					**$3.08/cow**
					$7.26/cow

Cow/management Benefits

Accuracy at Herd testing and herd records in general convienence of data entry

Hours saved per season	7 minutes/cow	30 hours		$30	$2,380
Herd Gain in value with % reliability increase - mating and herd testing accuracy	History @LUDF was good but there will be gains here				
Accuracy in health treatment records and drafting	Quality and relaibility/Insurance value	No Value attributed - LUDF has no historical problem			
			kgms/cow	**value/cow**	
Completed treatments and improved cure rate	1.00%	7 cows		$100	$680
Identifying high SCC cows after herd test	Used with good success at finding cows promptly	2.5	4	$30	$300
Split herds numbers and cows - kept the same = feeding accuracy = milk, cow condition, days in milk	Very difficult to prove any gains @ LUDF - One herd all season.		0	$0	$0
Mating accuracy					
Cows mated right day (not late)	1%	7	30	$180	$1,224
Semen saved from better IC rate	0%	0		$15	$0
Simplification of cow ID for AB technician and recorder	0.16 hrs	56 days	$30.00 /hr		$269
Improved in-calf rate = opportunity for production culling	Hard to see any real gain @ LUDF		0	$0.00	$0
Prompt treatment of sore feet	2%	14 cows		$350	$4,760
More accurate info cow side = better culling /treatment decisions during season	Decisions already well made with MINDA in the office cows are easy to find but this is recorded already				
Production gains from timely cow management actions all season	1kg milksolids gain/cow would generate break even.	0.00 kg ms/cow			$0
					$7,233
					$10.64/cow

Total savings / additional income	**$12,168**
	$17.89/cow
Annual Profit/loss	**-$3,189**
	-$4.69/cow
	-4.2 % RoC

Assumptions
Milksolids **$6.00/kgms**

Soil Water and Temperature monitoring using – Aquaflex
LUDF 2007-08

This season the aquaflex soil water and temperature monitoring has been delivering instant and believable data in graphic form on the computer in the dairy.

During the week the graphics (examples below) are looked at regularly by Peter and used to make irrigation decisions.

Each Tuesday during the discussions that follow the farm walk theses same graphics are viewed to help make decisions for the week ahead. Pasture growth predictions have been more accurate giving greater confidence around rotation length, silage feeding and feed conservation decisions.

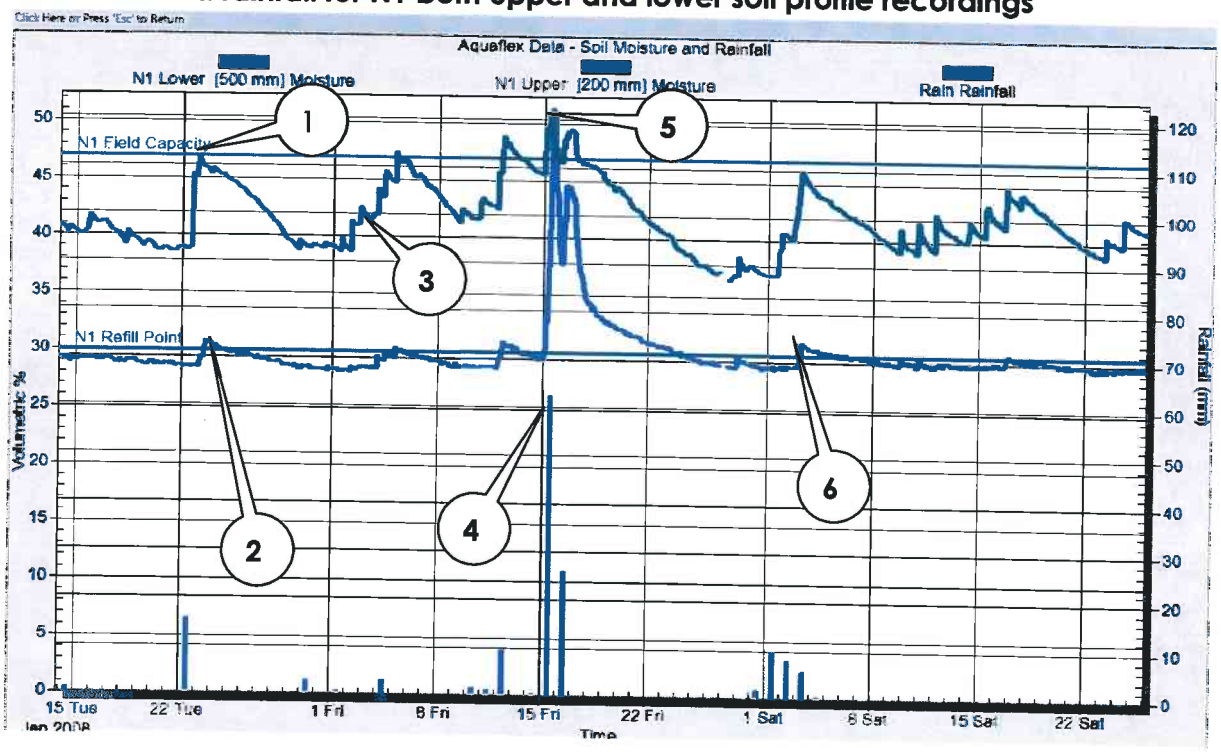
The other spin off is that we have been more confident to have the soil moisture closer to the field capacity line. We believe by doing this we have been able to reduce the pasture damage from pulling of grass grub damaged areas. The farm is also in a stronger position to cope with down time caused by a breakdown of an irrigator.

Parts of the system

- Buried 3m long aquaflex sensor tape attached to a logging device and radio sender.
- A radio reciever at the dairy connected to the computer.

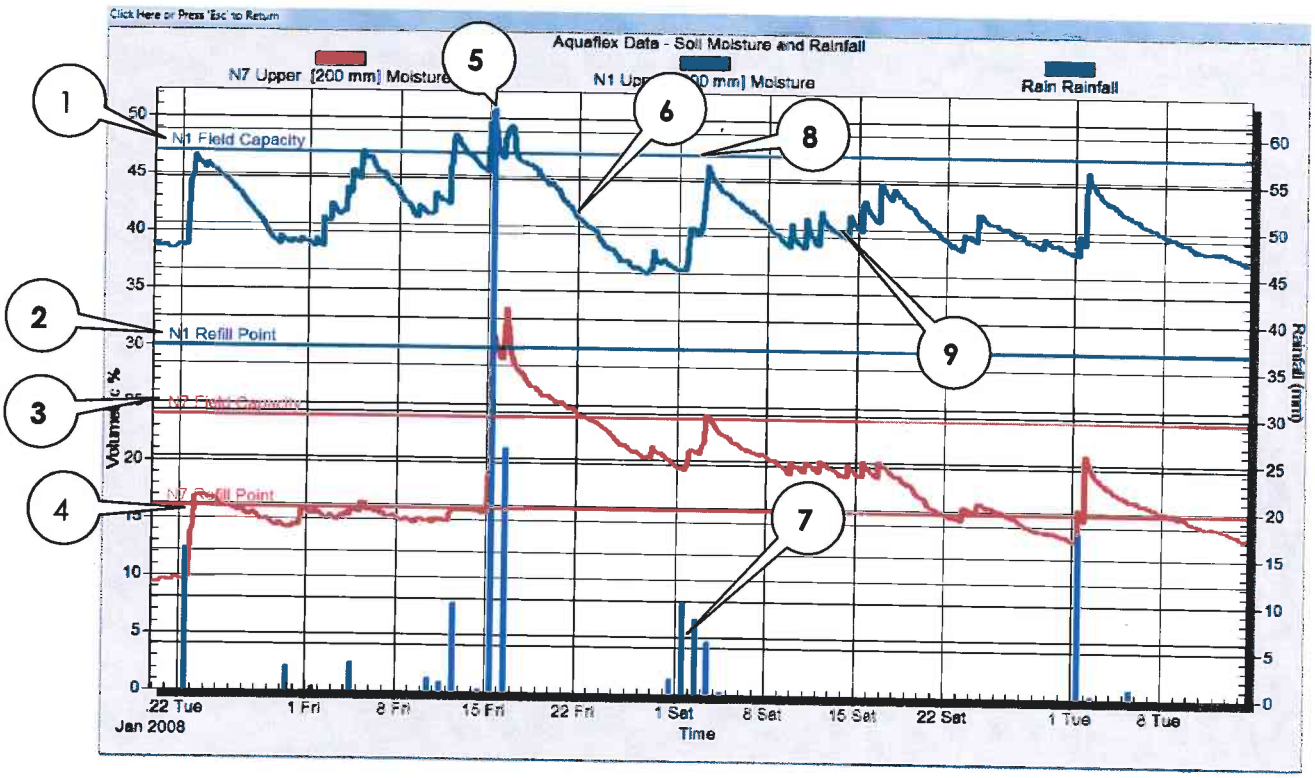
The Graphics

Soil water and rainfall for N1 both upper and lower soil profile recordings



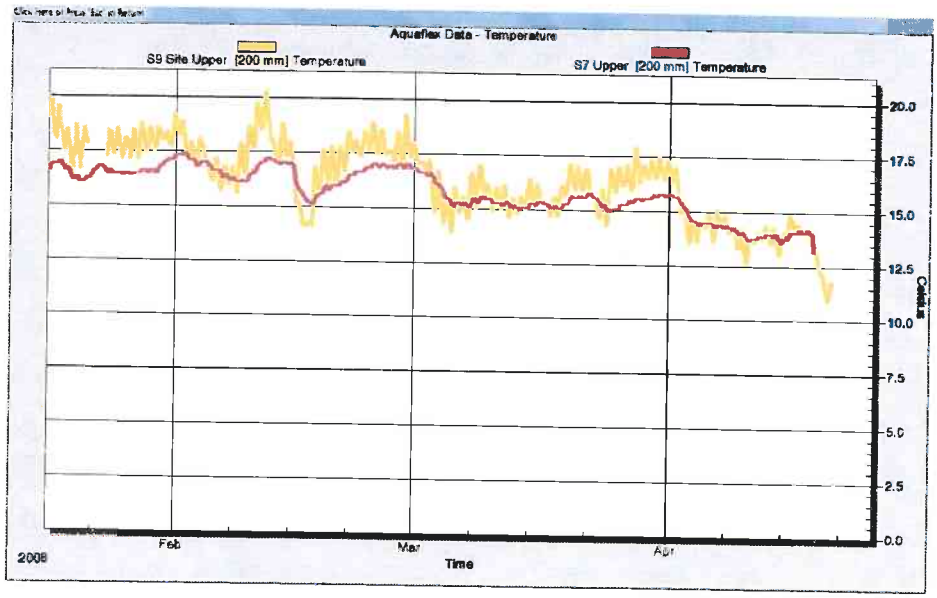
1 At this point the upper profile was indicated a up to field capacity
2 The lower profile showing a rise but not enough to create a drainage event
3 Each pass of the pivot irrigator recorded – irrigation at this time able to get ahead of evapotranspiration
4 Significant rain on the 15th of February
5 Both upper and lower profiles go well above field capacity
6 Another rain event Upper soil moisture rises but little rise in the lower profile

Soil moisture recording for a lighter soil N7 and free draining but heavier N1

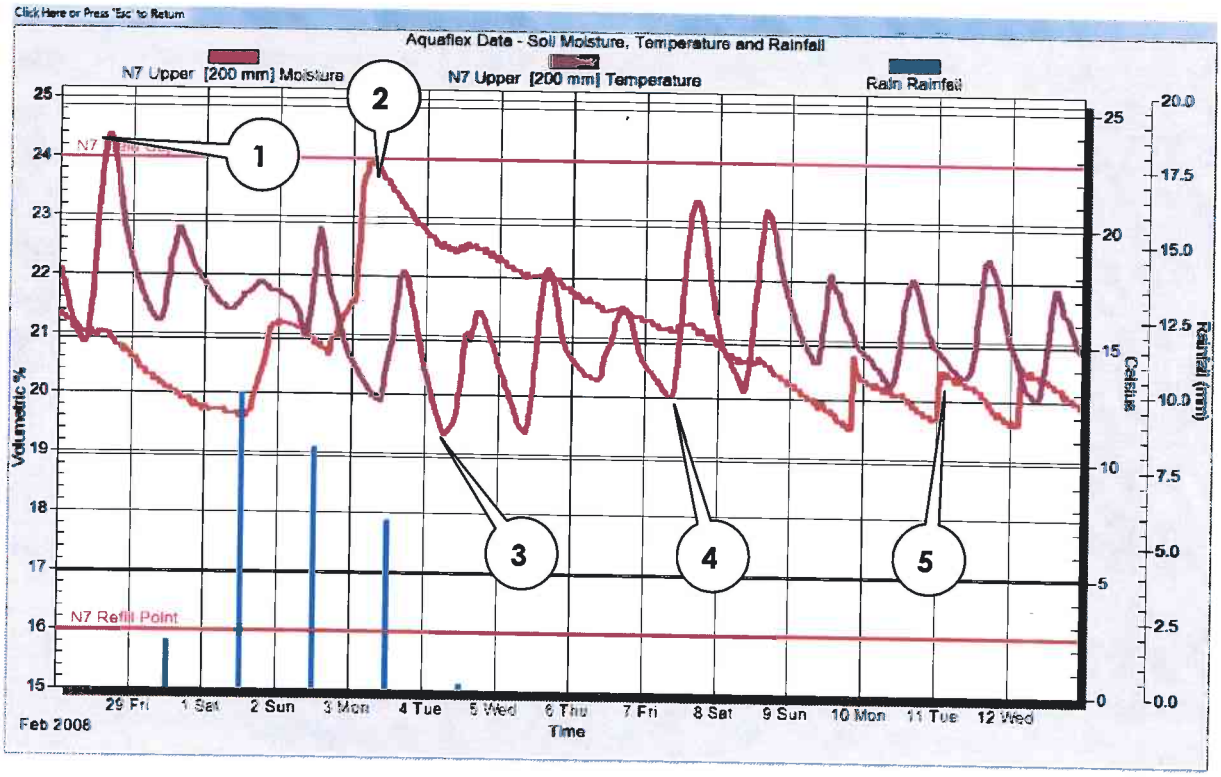


1 Field Capacity for N1
2 The estimated point at which refill needs to occur for N1
3 Field capacity point for N7
4 Refill point for N7 note This soil started from a much lower point at this time
5 Rainfall event over 3 days 20 –25mm of drainage occurs – the only drainage event recorded during the period graphed
6 No irrigation soil moisture allowed to decline
7 Rain on the 1st of March
8 Upper soil remains below field capacity
9 Irrigation on the heavier soil raising soil moisture but not lifting in the lighter soil very much

Daily Soil Temp Variation is less on clay soils compared with free draining soils



Soil moisture and temperature for N7 14 days late February early March



1 Upper soil temperature at 23.5 Celsius day time high

2 Upper soil moisture just at field capacity after rain

3 Soil temperature declines significantly after the rain

4 Soil temperature rising after the rain and during warmer weather

5 Irrigation applications making no visible impact on the soil temperature recordings

Return on the Investment

System 4 soil probes and telemetry equipment **$13,000** with very low running costs

Depreciation and capital say $2,600 per year

- Less soil drainage with subsequent loss of Nitrogen
- Less irrigation -The one budget item below expectation this season. $10,000
- More confident grazing/pasture management decision making
- Confidence to water closer to field capacity with better margin for breakdowns and less damage from Grass Grub

Lincoln University Dairy Farm Focus Day

8 May 2008

Short Gestation Length

and

Sexed Semen

Outline of current LIC Breeding Schemes, Research and Development

Jack Hooper
Senior Advisor – Farm Trials

SHORT GESTATION LENGTH

The concept was conceived in 1998, the intention being to grow the AB market through

- a product that would provide a benefit to farmers over the tail-up bull
- a potential solution should inductions no longer be viable

Initially

Trialled low-line Angus as this was, at the time, promoted as short gestation. Results of that trial, however, showed no gestation length advantage.

Next Actions

Were the implementation of the proposals of a science review, which indicated that if we selected the best bulls within the Sire Proving Scheme (BV – 9.5) and commenced a single trait short gestation length breeding scheme this figure would extend to –15 BV by year 7.

The resulting SGL breeding scheme initially used contract mating and subsequently created a nucleus herd utilising IVP technology.

10 – 15 heifers/cows enter the reproductive technologies program each year with the aim of generating 35 – 40 heifers and 35-40 bulls

The best 10 – 15 heifers are retained and used as donors in future reproductive technologies programmes. The best bulls are retained; semen is collected and distributed for progeny test purposes. The best bulls from the progeny test are then made available for wider use in the national herd.

	2004	2005	2006	2007	2008	2011	2017
Shortest BV Bull Marketed		-8.5	-10.1	-12.5	-12.5		
Alpha SGL Team Average	-7.3	-7.6	-9.1	-9.8	-10.1	-14.0?	-18.0?

Note: - Single trait selection with no attention to BW or TOP

Future

We are at the crossroads with four potential development pathways to consider:
1. Continue with the existing dairy SGL programme
2. Apply more effort into the Hereford SGL programme
3. Introgress the phenotype marker of the Hereford white-face into the dairy bull
4. Yaks

Hereford SGL Programme

- Normal gestation length of a Hereford bull over a dairy animal is + 3 days
- Current Hereford SGL bulls available are – 3 days compared with an average Hereford i.e no advantage over dairy
- Features of this cross include phenotypic marker and beef qualities
- We continue to talk with the Hereford Association about a breeding program.

Yak – Short Gestation Length Potential

Yaks typically have a gestation length of 257 days compared to 282 days for dairy cows. Therefore on basis of parent average expect –12.5 days.

2006 Limited number of frozen yak inseminations resulted in 43 confirmed yak cross calvings averaging 20 days shorter gestation
Calves born were very similar to normal dairy calves albeit more hairy, and were fit and healthy with growth rates similar to dairy calves.

2007 The Yak solution for SGL is an exciting possibility, however further trial work is necessary to confirm this. It should be noted that the Yak is a seasonal breeder and this, in itself, presents a significant number of issues.

Trials in 2007 to establish-
- Semen collection, quantity and quality
- Conception rate against control animals
- Gestation length
- Calving ease
- Phenotypic marker
- Calf health and vigour
- Calf value

The Yak programme must be considered developmental in nature until a number of questions are answered. The level of interest from people in 2007 was significant.

Sexed Semen

Only one technology, known as flow cytometry, has been proven to work, delivering 90% heifers this technology is owned by "Sexing Technologies" based in Texas.

In the USA more than 1 million doses of sexed semen are sold annually, the main driver being to maintaining herd numbers due to falling reproductive efficiency.

From a single ejaculate approximately 10% of the sperm end up in the "heifer sexed" pile, which are used to fill straws. The rest of the ejaculate is wasted. To maximise the number of straws, lower total sperm rates are often used resulting in an inferior conception rate when compared with the conventionally frozen non-sexed product.

This situation leads to second tier or unproven bulls being marketed as opposed to top bulls, which have a ready demand for all semen produced. They cannot withstand 90% being thrown away

Sexing Technologies issue five-year licences for the provision of equipment and technology. These licences are not cheap and it is imperative, prior to consideration of any formal arrangement, that a product that is developed and adequately tested under New Zealand conditions and found to be comparable in conception rates to existing products.

2007 Trials

a) Frozen Sexed Semen Trial in NZ

Semen processed by Sexing Technologies
Two unproven USA Holstein Friesian bulls
In January/February 2008 approximately 1400 cows inseminated with either sexed semen or Premier Sires were pregnancy scanned. Due to our relationship and supply agreement with Sexing Technologies we are unable to publish these results at this point in time. Our expectation of the result prior to the trial that pregnancy rates with sexed semen would be consistent with both the published data and inseminations made with frozen sperm at the lower concentration.

b) Fresh Sexed Semen Trial in Texas

During the spring, an LIC scientist assisted Sexing Technologies with the implementation of a fresh sexed semen trial in the USA.
The preliminary results from trials with fresh sexed semen processed at half the sperm concentration of frozen sexed semen, which was used as a control, are very encouraging

Further results are still to come.

The Future 2008-2009

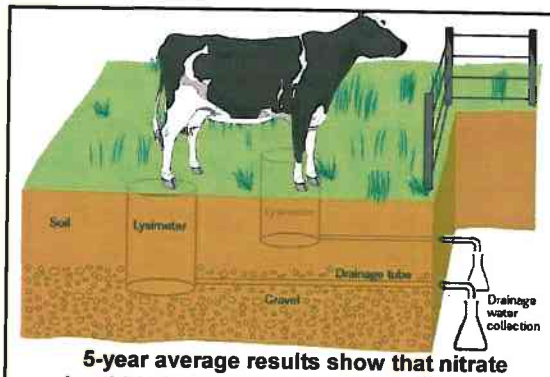
- Establish commercial viability for sexed semen within New Zealand farm management systems
- Invest in Research and Development to develop a fresh sexed semen product with non-return rates comparable with other semen products
- Monitor technology developments

Nitrate Leaching Results on LUDF

Keith Cameron, Hong Di and Jim Moir
Centre for Soil and Environmental Quality
Lincoln University

Research project funded by:
DairyNZ
Sustainable Farming Fund
Ravensdown

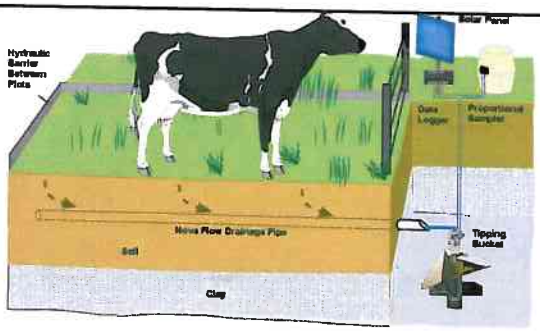
Lincoln University Dairy Farm has 60 lysimeters to measure nitrate leaching from free-draining soils on North Block.



5-year average results show that nitrate leaching losses from free-draining soils on North Block are low (c. 22 kg N/ha/y).

Drainage plots constructed to measure nitrate leaching from heavy clay soils on the South Block of LUDF.

Water is collected from below the grazed paddocks

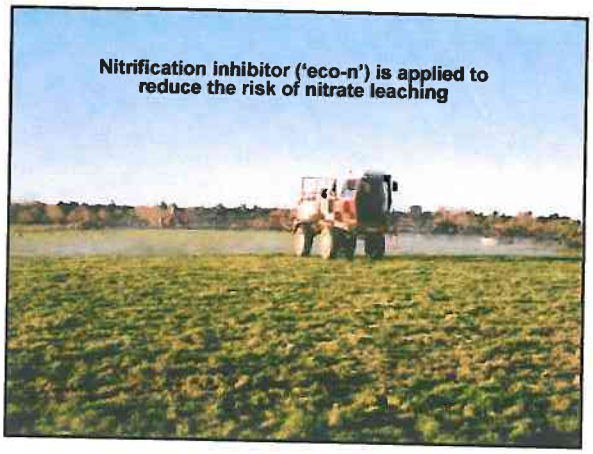


5-year average results show that nitrate leaching losses from clay soils on South Block are low (c. 20 kg N/ha/y).

In grazed pastures urine patches are the main sources of nitrate leaching

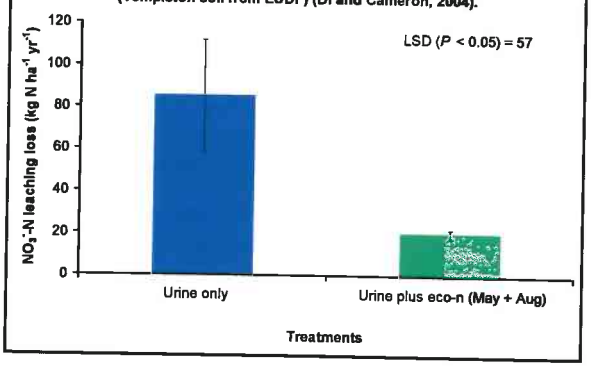
1,000 kg N/ha in urine patch (= 2 t Urea/ha) Urea fertiliser only applied at 30 kg N/ha

Nitrification inhibitor ('eco-n') is applied to reduce the risk of nitrate leaching



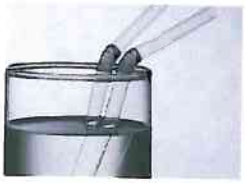
Eco-n reduced the nitrate leaching loss by 76%

(Templeton soil from LUDF) (Di and Cameron, 2004).



Best Management Practices to Reduce Nitrate Leaching

- Nitrification inhibitor technology ('eco-n') – used to improve soil N cycle efficiency and reduce nitrogen losses
- OVERSEER® Nutrient budget - used to calculate the correct amount of fertiliser to use
- N fertiliser and effluent - applied at rates that meet plant demand
- Irrigation- best management practices used to ensure highest efficiency and minimise losses



5-years of monitoring on the Lincoln University Dairy Farm shows no increase in bugs in groundwater.

Conclusion

- The environmental impact of dairy farming can be minimised through careful management of nutrients, irrigation, effluent, pasture and stock.

IT'S GOOD TO VOTE

25%
MORE FROM YOUR FEED

YOUR FEED NOW GOES 25% FURTHER THAN IT DID 20 YEARS AGO. WE KNOW, BECAUSE WE TESTED IT COMPARING TODAY'S HERD AGAINST COWS SPECIALLY BRED TO BE GENETICALLY SIMILAR TO THOSE OF THE 1970S. THE STRAIN TRIAL PROVED THE VALUE OF INCREMENTAL GAINS ACHIEVED BY THE SBW (BREEDING WORTH) SYSTEM. DID YOU KNOW YOUR MONEY CONTRIBUTED?

LOCAL LEVY FUNDED ACTIVITIES INCLUDE

- PARTNER IN SIDDC TO PROMOTE ADVANCEMENT OF SOUTH ISLAND DAIRYING
- TECHNICAL SUPPORT FOR THE LINCOLN UNIVERSITY DAIRY FARM
- REGULAR SCIENCE / TOPICAL ROADSHOWS
- CO-FUNDING OF THE SIDDC DAIRY SUPPORT LAND PROJECT

76%
DROP IN TB INFECTED HERDS

SINCE 1996, THE NUMBER OF HERDS INFECTED WITH TB HAS DROPPED FROM 230 TO 55. INTERNATIONAL STANDARDS REQUIRE US TO KEEP TB INFECTION RATES DOWN, MAKING OUR INVESTMENT WITH THE ANIMAL HEALTH BOARD A CRUCIAL ONE TO PROTECT OUR POSITION ON THE INTERNATIONAL MARKET.

$150 million

BECAUSE FARMERS ARE INVESTING $50 MILLION A YEAR INTO INDUSTRY GOOD ACTIVITIES, DAIRYNZ IS ABLE TO ATTRACT ANOTHER $100 MILLION FROM OTHER FUNDERS SUCH AS GOVERNMENT AND INDUSTRY PARTNERS.

"DON'T LEAVE IT TO SOMEONE ELSE! HAVE YOUR SAY IN YOUR INDUSTRY DECISIONS. MAKE YOUR VOTE COUNT. IN THESE CHANGING TIMES WE NEED TO STAY AHEAD OF THE GAME. HELP OUR RESEARCHERS TO HELP US. MAKE SURE YOU VOTE."

Teresa Booker,
Chair of South Island Dairy Event

"WE EITHER CONTINUE WITH THE LEVY TO CONTROL OUR INVESTMENT AND GET THE BENEFIT OF R&D SOLUTIONS TO OUR MAJOR ISSUES OR SOMEONE ELSE WILL TAKE OVER TO SUIT THEMSELVES. I'M VOTING FOR DAIRYNZ BECAUSE I WANT TO STAY IN CONTROL."

Vaughan Templeton,
Southland

MAKE YOUR VOTE COUNT

You can vote by return post, fax, or online via www.dairynz.co.nz

DairyNZ

Profitability. Sustainability. Competitiveness.

Farm Automation

- Drivers
- Future Developments

Definition

•Hardware and Software primarily at the Farm Dairy that allows Farmers to Manage their Herds, plant, and farm system more effectively or efficiently.

Presented by: Garth Anderson

LIC

Drivers

- EID tags
- Labour Savings
  - Mainly shed/milking management, and drafting
  - ACRs, bail retainers, milking management systems, Auto teat spray units
- Feeding management
- Ability to manage INDIVIDUAL cows
  - Cow history, treatments, production status, events, feeding, weights (BCS)

LIC

Drivers

- Data Capture Storage and manipulation
  - From measurement devices
    - - milk meters, mastitis detectors, Oestrus detectors, WOW, others to be developed
- Commercial Innovations
  - From research findings (Dairy NZ), from customer demand, Commercial entities' product developments.
    - AOD, Milkhub, Sensortech, pedometers, milking management, conductivity Trutest and Gallagher WOW, Wetit

Future Products

- Herringbone cow to bail ID
  - Will allow many more sheds to gather information and manage individual animals
- AOD – different methods available
  - Activity meters
  - Cameras and heat detection devices
  - Each has advantages and disadvantages
    - Cost, ease of use, Maintenance and service, **ability to integrate with your Herd management software and drafting application**

Future Products

- Measurement devices
  - Production, health, fertility, events eg calving lameness, pregnancy, Ketosis
- Auto Cups on robot
- Telemetric measurements.
  - Weather stations, water management devices, pasture monitors, soil temperature, milk weights, these can be integrated with Farm Mapping and full farm mangement software
- Automated Herd Testing

LIC

What Value do you get from this data?

- Very little unless you can use and manipulate this data.

⇩

SMART SOFTWARE

- **Full farm software that integrates all these devices and systems**
- Predictive Learned Software, analyses trends, patterns and historical results and gives management prompts

LIC

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Result

- Management made easy
- Smarter decisions
- Changes in staff skill sets
  - Workers
  - Analytic Decision makers

41.

Pastoral 21 Programme: Feed and Environment
Delivering sustainable forage productivity gains

Forage Crop Sequence Trial: Thursday 8th May 2008, Shands Road, Lincoln

Programme

Introduction

The forage crops trial at Lincoln is part of the Pastoral 21 Feed and Environment programmes that started last year. They are supported by DairyNZ, Fonterra, Meat & Wool NZ and the Foundation for Research, Science and Technology. The programmes are led by AgResearch and are operated by Crop & Food Research, AgResearch, DairyNZ and Lincoln University.

The pastoral industry feed strategy has two goals:

1) Production: 35 to 50% more ME production/ha from grazed forage by 2015 while maintaining or reducing on-farm costs.
2) Environment: N leaching losses reduced by 50%.

The aims of the forage crops part of the programmes are to maximise feed production and utilisation while minimising environmental impacts, and to fit the crops into pastoral systems. It has an aspirational target:

To produce 45 t DM/ha per year and 11.0 MJ/kg ME

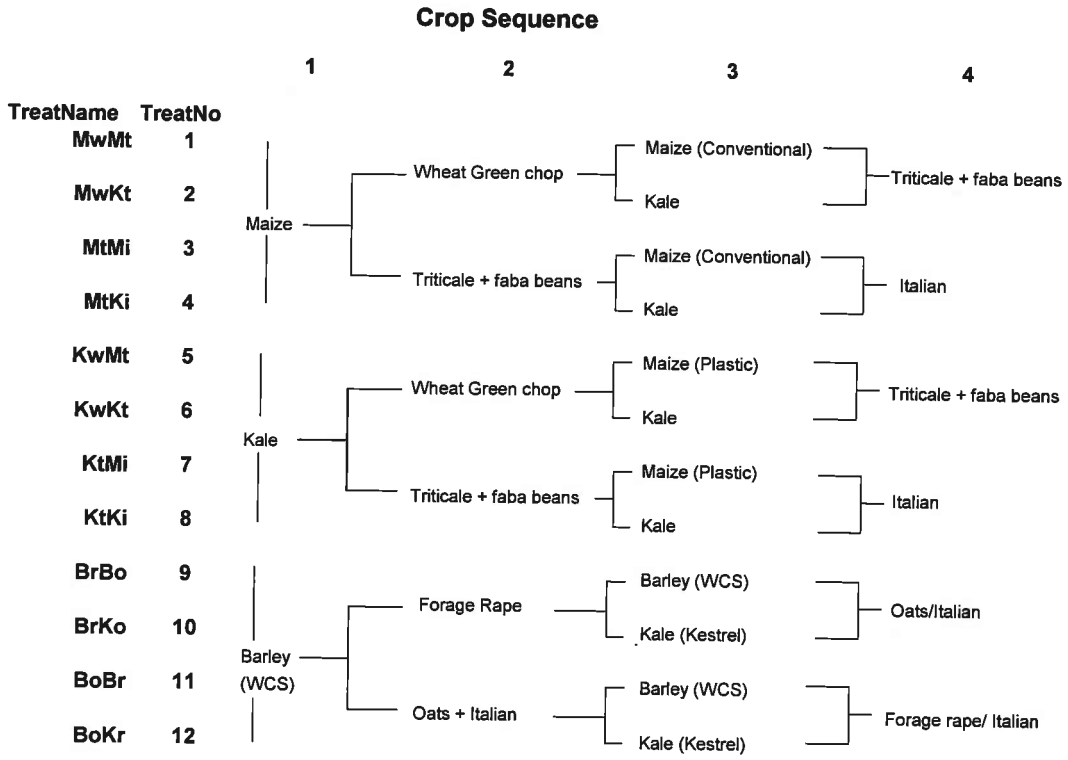
Activities include:

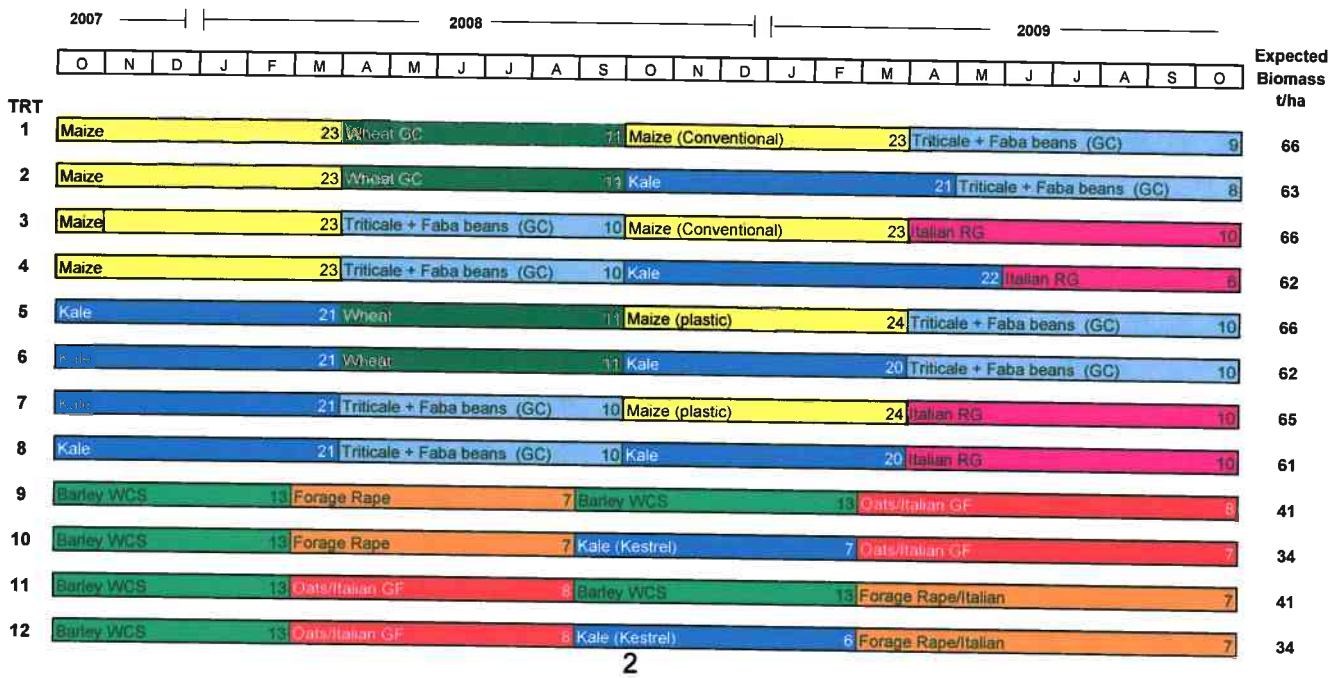
- Modelling to explore the theoretical upper limits of forage crop production in NZ.
- Field trials at Lincoln and Ruakura to explore the practical upper limits in trial situations.
- On-farm trials to explore real-world limits.

Optimum use of inputs, especially water and nitrogen, is crucial to achieve both the production and environmental goals. To achieve this, research is coordinated between the Pastoral 21 Feed and Environment programmes.

Sequences to Maximise Productivity of Forage Crops

- The trial started in October 2007 to measure the yield potential, quality, and N and water use efficiencies in 12 two-year cropping sequences (plans below).
- Crop sequences have been chosen to maximise DM production and limit N losses to the environment.
- They started with maize, kale and barley during the first summer and will evolve into twelve sequences during the next two years.
  - Treatments **1-8** have kale and maize as the main summer crops.
  - Treatments **9-12** include more 'grazable' crops such as rape, oats/grass.





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Results

(a) Weather

- **Rainfall:** Above average for Oct, Feb, Mar and Apr but below average for Nov, Dec and Jan.
- **Temperature:** Monthly means were close to the long term means.
- **Evapotranspiration:** Close to average.

	2007/08					Long term (20 year Mean)				
		Temperature			Daily		Temperature			Daily
Month	Rainfall mm/month	Max °C	Min °C	Mean °C	Penman ET (mm)	Rainfall mm/month	Max °C	Min °C	Mean °C	Penman ET (mm)
October	79.2	16.9	5.0	11.0	4.0	54.9	16.7	6.0	11.3	3.4
November	41.5	18.3	7.6	12.6	4.4	55.7	18.4	8.0	13.1	4.1
December	58.8	21.2	11.3	15.8	4.6	61.3	21.3	10.2	15.7	4.6
January	19.2	22.9	12.0	17.2	5.0	50.3	22.6	11.4	17.0	5.1
February	105.4	21.1	12.4	16.1	4.0	51.3	21.7	11.0	16.3	4.0
March	23.6	20.4	10.0	14.9	3.0	58.9	20.1	9.9	15.0	3.1
April	35.7	17.5	6.7	12.1	1.9	51.8	17.5	6.7	12.2	2.1

(b) Soil

- Paparua sandy loam over sand, free draining and potentially 'leaky' for N and water.
- **Fertility:** 0-15 cm quick tests:
  - 1 July: pH = 5.7, Ca = 6, Olsen P = 23, K = 15, S(SO_4) = 12, Mg = 10, Na = 6.
  - 12 Sep: pH = 5.9, Ca = 8, Olsen P = 14, K = 9, S(SO_4) = 5, Mg = 7, Na = 7.
  - 12 Sep: Mineral N = 30 kg/ha.
  - Potentially mineralisable N (AMN) after barley crop = 89 kg N/ha
- **Water monitoring:** regular two-weekly neutron probe (deep) and TDR wave guides (surface); soil water deficit managed by water budgeting.
- **N monitoring:** solution samplers at 60 and 100 cm:
  - Sample after each significant rainfall or irrigation.
  - Analyse NO_3 and NH_4 concentrations.
  - Calculate N losses and balance for each crop and cropping sequence.

(c) Water balance

(d) Yields

- Barley and maize were planted on 23 October and Kale was planted on 25 October.
- All grew at the potential rates predicted by climate-driven models.
- **Barley:**
  - **H**arvested on 29 January produced 16.4 t DM/ha.
  - Rape or oats/annual ryegrass were sown on 31 January.
  - Yields @ 14 April
    - Rape - 4.0 t DM/ha
    - Oats / annual ryegrass - 6.95 t DM/ha
- **Maize:**
  - Its yield was 23.2 t DM/ha when harvested on 25 March.
  - Winter wheat or Triticale/ Tickbeans were sown on 28 March.
    - Wheat - no yield data

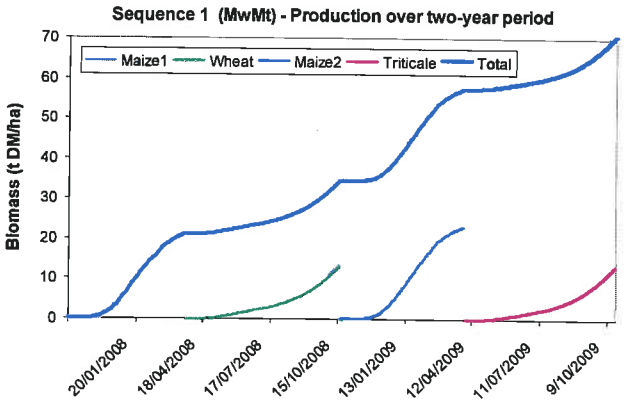
44.

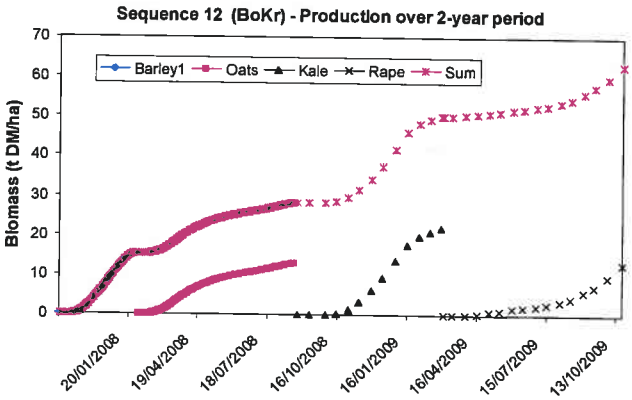
- Triticale/ Tick beans - no yield data

- **Kale:**
  - Its yield was 21.3 t DM/ha on 6 March, and still increasing.
  - Winter wheat or Triticale/ Tickbeans were sown on 1 April.
    - Wheat - no yield data
    - Triticale/ Tick beans - no yield data

(e) Transitions

- Transitions between successive crops have a major impact on annual production.
- The yield penalty is greatest with mid-summer transitions, such as after the barley, and least with spring and early autumn transitions.





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Crop Management

Inputs per ha
Rotation 1

Management	Maize (P39G12)	Kale (cv Gruner)	Barley (cv Salute)
Fertiliser at sowing	300 kg Nitraphoska + 50 kg N	300 kg DAP + 15kg Boronate	150 kg Crop15
Fertiliser during growth	125 kg N	250 kg N	2 x 50 kg N
Total N: P: K: S	211: 30 :30: 1.2	282: 44: 0: 38	123: 15: 15: 12
Herbicide	Lasso (7L) + Bladex (1.1 kg)	Treflan (1.7L) (pre sow)	
Insecticide	Treated seed Lorsban (1L)	Superstrike seed trt Diazinon (1L)	Poncho seed trt 150 ml Pirimor 40 ml Karate
Fungicide			Vitaflow seed trt 400 ml Proline 300 ml Opus 400 ml Amistar
Growth regulator			200 ml Moddus
Irrigation (mm)	336	336	219

Economics of Summer Crops

Costs $ per ha (excluding harvesting costs)

	Maize (P39G12)	Kale (cv Gruner)	Barley (cv Salute)
Cultivation	$ 320	$ 320	$ 320
Planting	$ 150	$ 80	$ 80
Seed	$ 638	$ 108	$ 447
Fertiliser (inc spreading)	$ 720	$ 977	$ 580
Weed, pest and disease	$ 459	$ 266	$ 204
Irrigation	$ 470	$ 470	$ 307
Total Costs	**$ 2757**	**$ 2221**	**$ 2205**
Break even yield @ 20c/kg	**13.8**	**11.1**	**11.0**
Yield (t/ha)	**23.2**	**21.3**	**16.4**
Revenue@ 20c/kg	**4640**	**4260**	**3280**
Margin	**1883**	**2039**	**1075**

Contact Details

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