

Focus Day

LINCOLN UNIVERSITY DAIRY FARM

Information Handout

26th October 2006

For further information visit: www.siddc.org.nz

or

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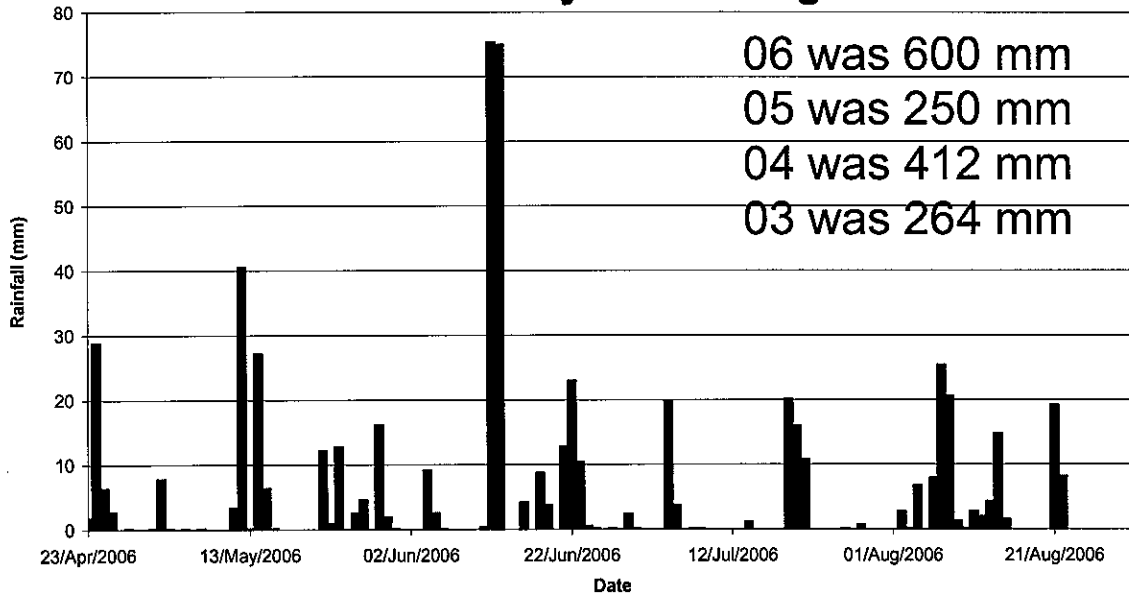
S I D D C – Partners networking to advance South Island Dairying



LUDF Focus Day Oct 06

What we had to deal with

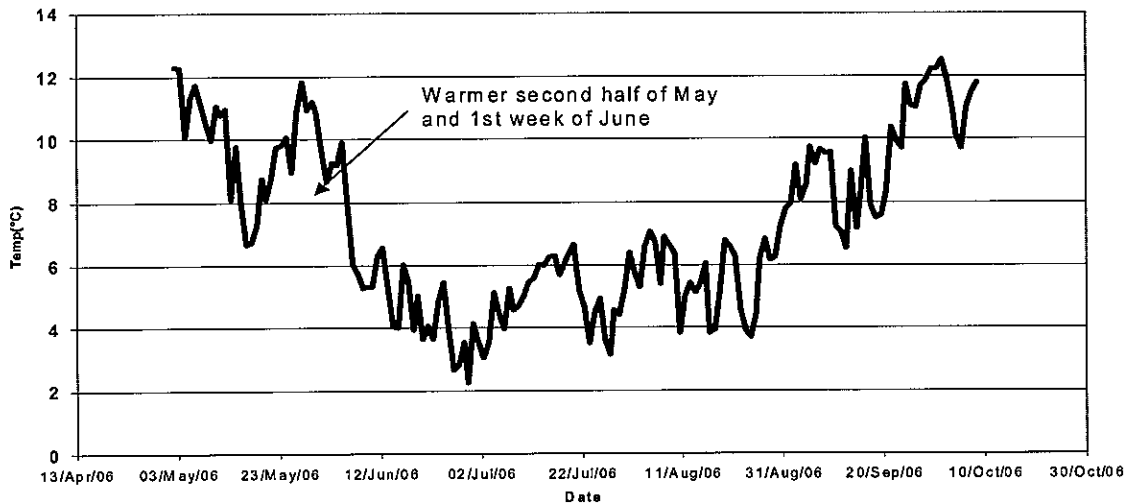
Total Daily Rainfall Anzac day to end Aug



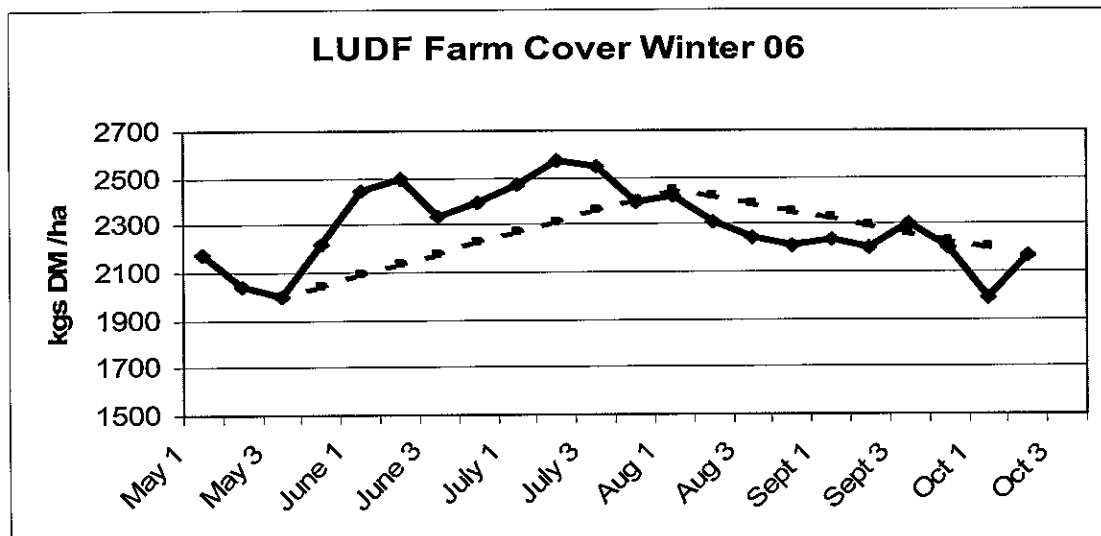
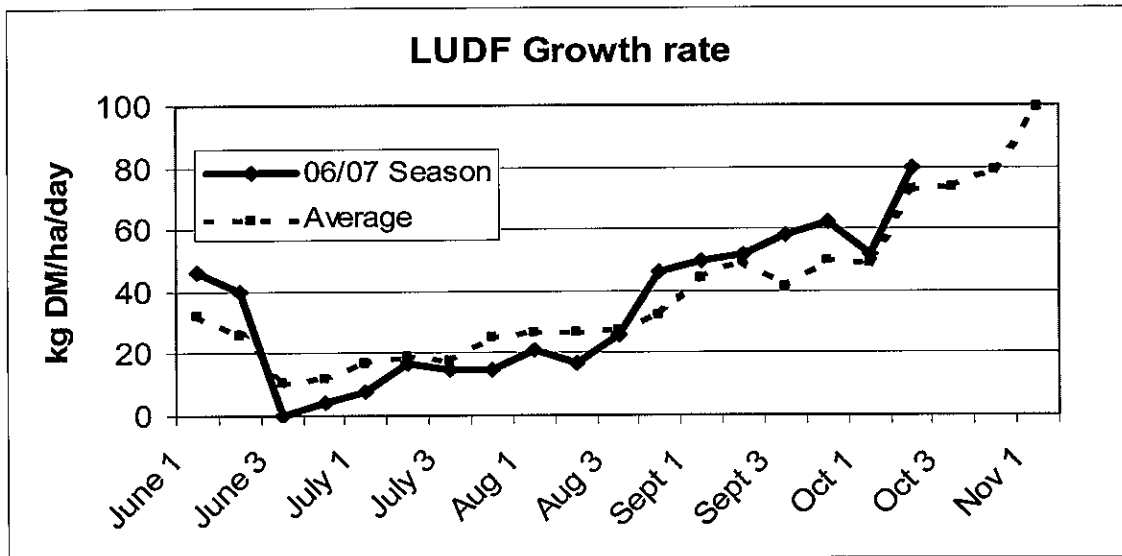
Rainfall was the problem NOT snow.

Cows were dried off about 13 May and were all sent off farm when ground conditions became too wet to prevent pugging.

Soil Temperature (10cm) at 9am



Warmer soil temperatures resulted in higher growth rates than budgeted in late May early June. This then reversed markedly after the snow and stayed low till then end of August.



Problems

1. Ground conditions on all the milking platform very soft.
2. Standing water over most of the South Block for weeks at a time.
3. No stock on the milking platform for long periods so covers rose above target.
4. Wetter paddocks still not grazed since early May soon had covers over 4000 kgs DM. Especially new grass paddocks S1 and S10.
5. Feed supplies on the wintering off blocks were running out faster than budgeted because of the extra numbers of animals.
6. After the snow soil temperatures stayed very low and pasture growth rates were lower than average for a long time.

What we did.

Before the snow event

1. Lightly grazed the longest driest paddocks with the milkers until they were dried off to prevent any pugging damage.
2. Removed all stock from the dairy platform and 18 ha support block.
3. Re- calculated all our feed budgets (milking platform, East block, and two grazing blocks) to account for the different numbers of animals.

After the snow event (a further 150 mm of rain) and before Planned Start of Calving.

1. Decided that this was now a long term problem where wet soil conditions and low growth rates would continue till at least the end of August (used historical data)
2. Limits were set on how much of our silage reserves would be feed to dry stock. 42t of silage was kept in reserve for feeding to milkers in the event of another snow event.
3. Reduced the pasture and silage ration to all mobs of stock. This was to make existing winter feed supplies last 1 –2 weeks longer than budgeted.
4. Fatter mobs were reduced to between 6 - 8 kgs DM /day, and lighter mobs to 10 kgs DM /day.
5. All mobs got Mg O dusted onto pastures and/or silage.
6. Updated our feed budgets for every block every week.
7. Purchased an extra 7 days wintering grazing for 305 fatter cows. (included a rotting oat crop)
8. Brought light cows home whenever ground conditions were dry enough to lightly graze the longest paddocks using on/off grazing to prevent pugging damage.
9. Condition scored all mobs fortnightly and drafted out any cows that were very different to the rest of the mob (either lighter or heavier) and put them with a more suitable mob.
10. Lighter mobs continued to always get the better quality feed.

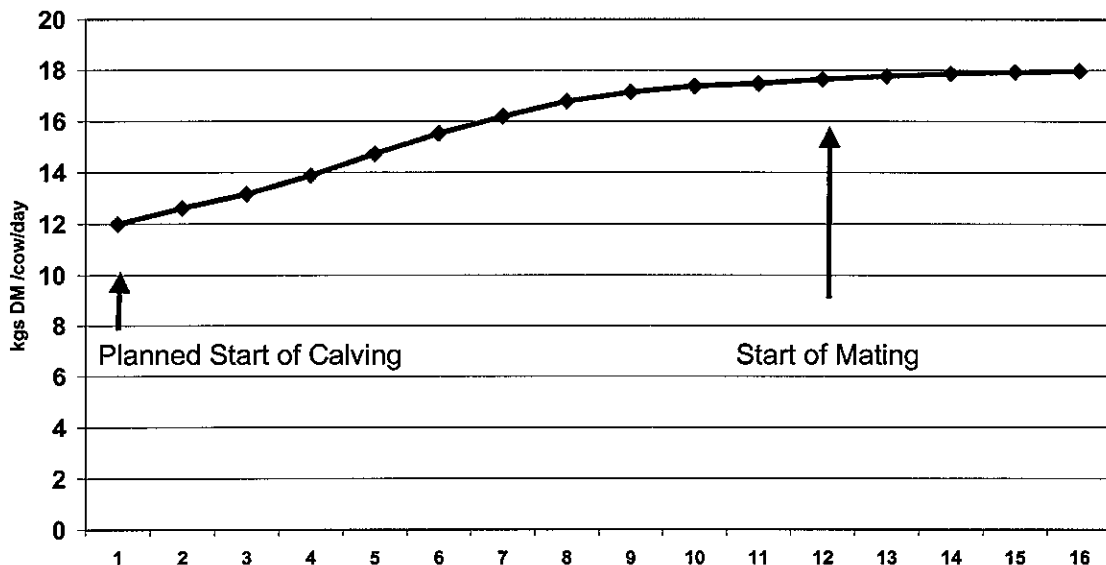
From 2 weeks before the planned start of calving.

1. Cows and heifer about to calve, were drafted out of their wintering mobs several times a week, and brought to the 18 ha support block next to the milking platform.
2. Springing cows feed allocation was restricted to 10 kgs DM/cow/day. This was done to make the built up feed on this block last for the whole calving period.
3. The springers were stood off from 4pm to 9am on 21 occasions (and calved) in the milking yards during from late in July until mid August.
4. Colostrum cows were also stood off from 4pm to 9am on to concrete on 21 occasions.
5. Colostrum cows as well as lame, mastitis, and other un-well cows were only milked OAD in the morning.

6. The pasture allocation to the calved cows was strictly rationed.

Calving Spread					Cow Intake Allocated	
Week ending	WEEK	Heifers	Cows	Total	Wk from PSC	kgs/Dm/cow.day
early calved	before	72	26		before PSC	10
3-Aug-06	1	33	76	207	1	12
10-Aug-06	2	28	101	129	2	13
17-Aug-06	3	28	104	132	3	14
24-Aug-06	4	10	57	67	4	15
31-Aug-06	5	5	25	30	5	16
7-Sep-06	6	5	28	33	6	17
14-Sep-06	7	1	22	23	7	17.5
21-Sep-06	8	1	17	18	8	18
28-Sep-06	9	1	13	14	9	18
5-Oct-06	10		13	13	10	18
12-Oct-06	11		14	14	11	18
19-Oct-06	12		0	0	12	18
Number to calve		184	496	680		

Daily Cow Allocation on a herd basis
(above a residual of 7 clicks)



7. The milking herd were also on/off grazed.

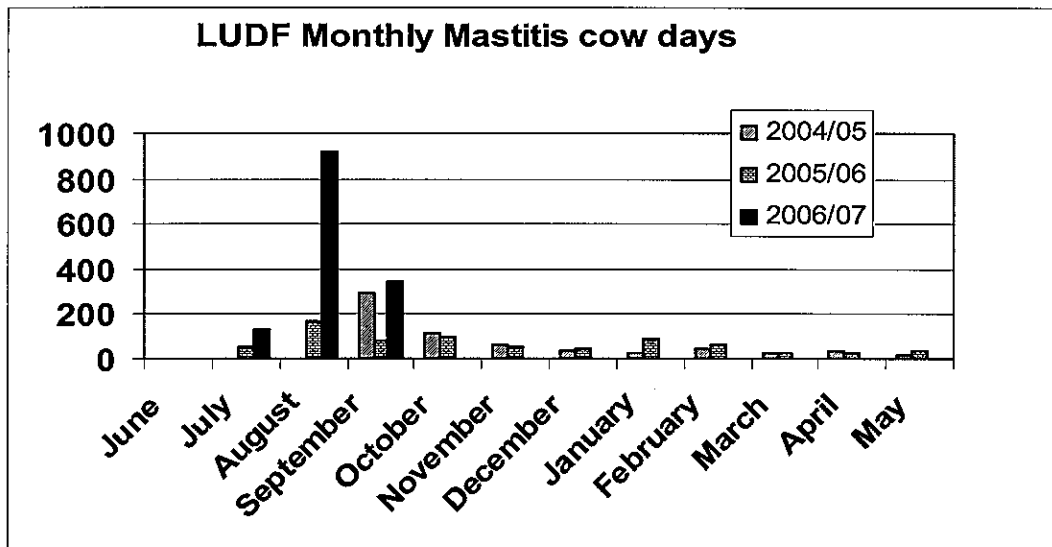
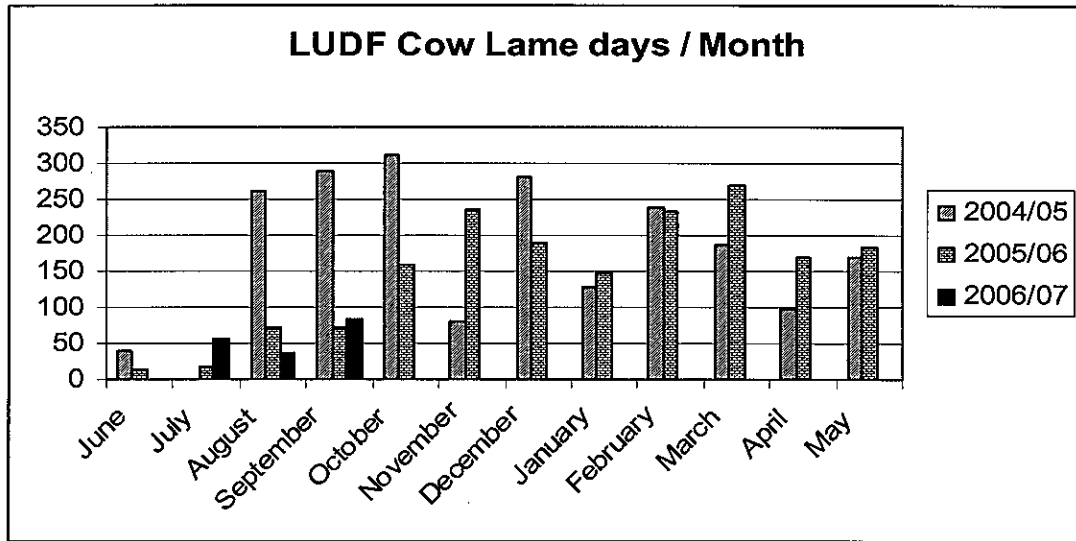
- On Concrete (yards at the cow shed) – 20 days, from 5am to 10am and again 1.30pm to 5.30pm
- In a sacrifice paddock (S7) – 14 days
- Frequently – lightly grazed whole paddocks, which were then grazed to target residual when finally dry enough not to pug.

8. The calves were fed OAD.

9. S7 was sprayed out, cultivated and re-grassed in mid September as soon as soil conditions were dry enough over the majority of the paddock.

The Results

Animal Health

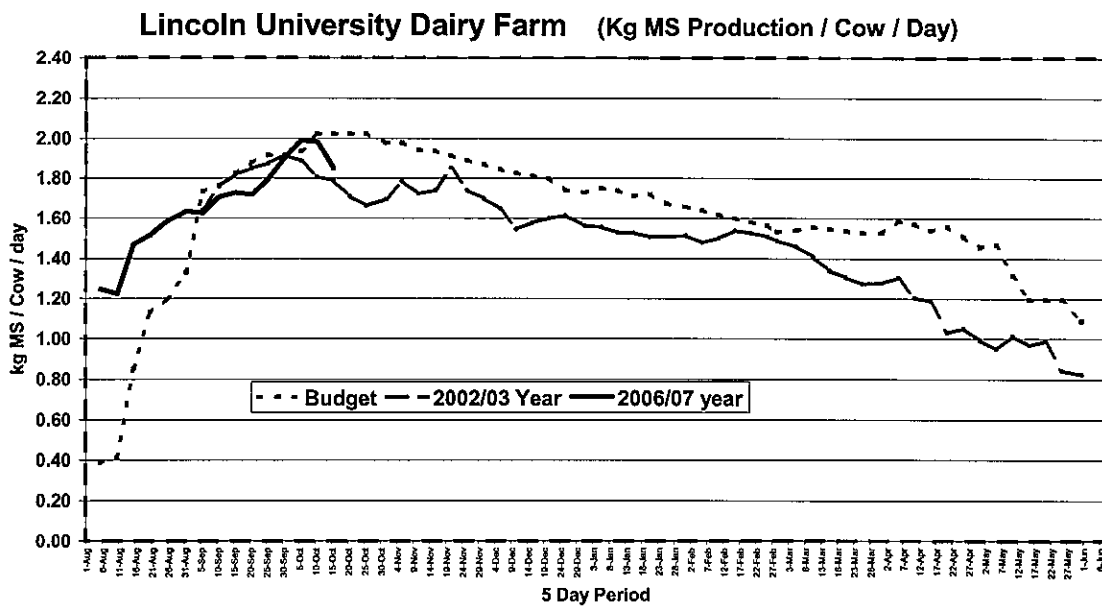
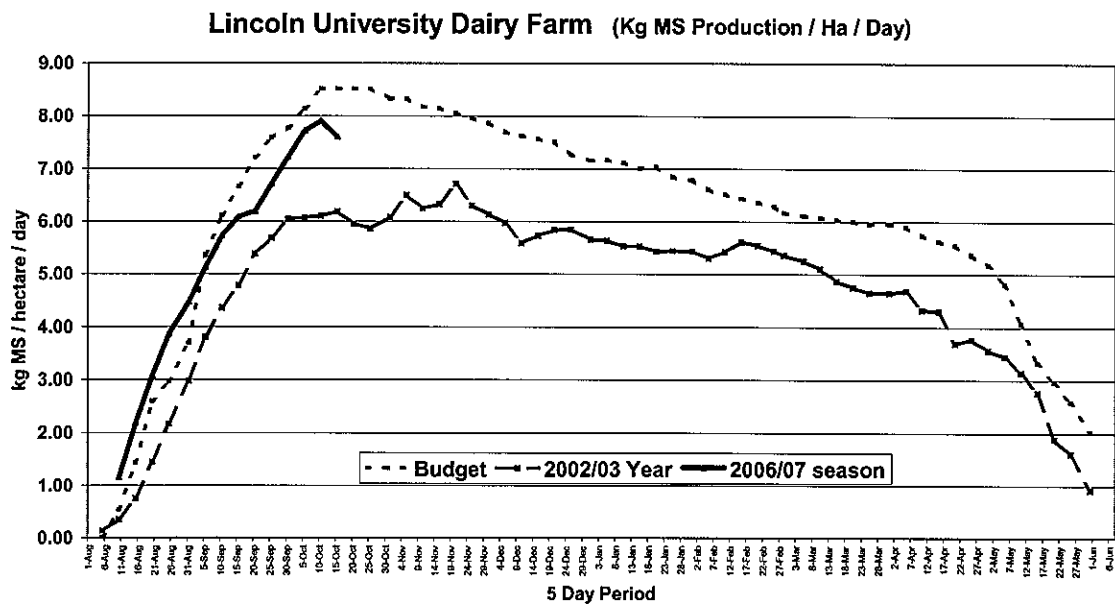


Cow Deaths

Month	Reason	Total
June		0
July	Accidental 2	4
	Milk Fever 2	
August	Accidental 3	5
	Bloat 1	
	Other 1	
September	Liver problems 2	5
	Bloat 3	
October (to date)	Bloat 1	1
Total		15

Culls – 6 MT + 1 fallen udder = 5

Production



Total production to the 15 October is 2% behind budget and 1.6% behind last year.

Supplements fed to date is 42t (62 kgs /cow)

Reproduction

LUDF Calving Rate of heifers

Spring	03 (No Syn)	04 (No Syn)	05 (Syn +2 + Bulls)	06 (Syn +7 + AB)
Pre PSC	0	6	61	72
Wk 1	8	29	50	33
Wk 2	20	30	16	28
Wk 3	29	27	16	28
Wk 4	16	14	12	10
Wk 5	19	11	2	5
Wk 6	4	10	5	5
Wk 7	4	10	4	1
Wk 8	0	2	5	1
Wk 9	3	3	3	1
Wk 10	0	1	0	2
Wk 11	1	0	1	1
Total calved	104	143	175	187

LUDF Calving /Mating data Comparison

Season	02/03	03/04	04/05	05/06	06/07
Days to mid (All herd)		22	23	14	12
Days to mid (cows only)		22	23	22	16
4 wk calving rate %	64	63	61	69	76
% calving month pre PSM	14	17	12	12.6	4
% treated Anoestrus		36.7	24.3	14.5	17%
% incalf at 12 weeks	84	83	79.5	84	

First 5 days of mating.

Heifers mated = $38 + 81 + 36 + (20) = 175$

Anoestrus treated cows mated = 100 out of 116 = 86%

Normally cycling cows mated = 147

Total = 422 out of 855 animals.

LUDF Breeding Policy

“The LUDF herd will be bred to maximise its ability to graze pasture and convert it profitably to milk solids, while retaining a 365 day calving interval and a wide genetic base.”

5-Year Breeding Objective/Target (to be reviewed every 2 years)

1. For the LUDF Herd BW to be within the top 5% of NZ herds.
2. That all cows will be calved naturally, a minimum of 30 days before the planned start of mating. .(with Nil inductions)

LUDF 2006/07 Breeding Objectives

1. Complete a 9 week AB mating period from a total mating period of 12 weeks.
2. To breed crossbred replacements for
 - Higher fertility and,
 - Higher BW
3. To Synchronise yearlings and mate with AB Jersey for 3 days for
 - easy calving,
 - additional heifer calves for replacements, and
 - simplicity.
4. The pregnancy target is to achieve a 12 week in calf rate of 88%.

Lincoln University Dairy Farm

Pasture analysis for 2006/07 season - pre grazing cuts

NOTE: We sample the paddocks immediately in front of the milkers, to height of 3.5cm (7 clicks on the rising plate meter)

The yellow entries indicates values that are at extreme or unusual levels.

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Sample Reference	Date sampled	% Protein	% WSC	% NDF	% ADF	Digestibility (DMD)	MJME per kgDM	% DM	% OM
N11 - 18 clicks	3/07/2006	20.6	30.7	31.8	17.8	87.8	13.4	21.9	92.0
S1 - 15.8 clicks	25/07/2006	19.1	33.4	30.3	17.4	89.0	13.5	19.1	91.5
S10 - 24 clicks	25/07/2006	13.5	37.7	31.8	18.2	87.8	13.4	19.4	92.2
Winter Grazing 24 clicks	25/07/2006	17.7	14.9	46.6	25.5	77.0	11.4	22.0	89.1
S3 - 18.4 clicks	2/08/2006	21.6	20.1	37.2	20.4	85.0	12.7	15.9	90.1
S9 - 19.8 clicks	2/08/2006	20.3	19.1	39.3	21.6	84.0	12.5	15.6	89.7
S2 - 17.3 Clicks	18/08/2006	19.4	25.2	37.5	20.1	84.6	12.7	18.9	90.7
S8, 19.4 Clicks	31/08/2006	20.9	26.3	33.7	20.4	86.7	13.2	20.8	92.0
N10, 21.2 Clicks	31/08/2006	20.0	23.7	37.7	21.5	86.0	13.0	20.5	91.2
N5 - 25.5 Clicks	13/09/2006	22.0	21.6	37.8	19.6	83.6	12.5	19.0	90.3
N7 - 23 Clicks	15/09/2006	22.7	24.2	35.4	18.0	86.7	12.9	19.5	90.0
S10 - 16.5 Clicks	18/09/2006	18.7	30.5	33.9	17.3	86.0	12.8	19.8	90.0
N6 - 18.9 clicks	21/09/2006	21.7	25.9	34.0	17.5	86.8	13.1	20.7	90.9
N2 - 16.9 clicks	23/09/2006	22.2	22.8	37.1	18.7	84.4	12.7	19.0	91.0
S9 - 19.4 Clicks	27/09/2006	18.6	27.4	35.1	18.8	85.2	12.8	20.2	90.9
N3 - 19.8 Clicks	29/09/2006	21.6	23.5	34.7	18.5	84.6	12.7	18.6	90.7
S2 - 18.4 Clicks	2/10/2006	22.2	22.2	37.8	18.8	85.5	12.9	19.5	91.0
N10 - 21.1 Clicks	4/10/2006	22.6	24.1	34.9	18.4	86.2	13.0	18.5	91.0
S4 - 18 Clicks	9/10/2006	21.2	27.7	34.6	17.9	84.8	12.8	16.4	91.1
N4 - 17 clicks	11/10/2006	19.4	28.6	34.0	17.5	86.0	13.1	20.6	92.0
N11 - 15.5 clicks	16/10/2006	20.1	23.0	37.1	19.7	83.4	12.5	18.4	90.4
CURRENT ROLLING AVERAGES :		20.3	25.8	35.4	19.0	85.7	12.9	19.1	90.9



Variance Report for LUDF

Compare Actual Actuals(2007) With Budget - Main (2007)
DateRange: Jun To Sep

	Actuals 2007		Budget 2007		Variance		GST Exclusive Actuals 2007 as a % of Budget 2007	
	\$	Qty	\$	Qty	\$	Qty	\$	Qty
INCOME								
Cattle Sales (Sales)	20,757		13,390		7,367		155 %	
Other Income	2,207		2,948		(741)		75 %	
INCOME	22,964		16,338		6,626		141 %	
MILK								
Milk Sales	242,689		248,532		(5,843)		98 %	
MILK	242,689		248,532		(5,843)		98 %	
NET INCOME	265,653		264,870		783		100 %	
FARM EXPENSES								
Administration	(6,025)		(8,500)		2,475		71 %	
Animal Health	(19,911)		(19,709)		(202)		101 %	
Breeding Expenses	(3,168)		(4,122)		954		77 %	
Electricity	(5,387)		(8,067)		2,680		67 %	
Feed	(96,207)		(116,217)		20,010		83 %	
Fertiliser	(23,944)		(24,585)		641		97 %	
Regrassing	(8,519)		(7,258)		(1,261)		117 %	
Repairs & Maint	(21,520)		(34,860)		13,340		62 %	
Shed Expenses	(1,757)		(2,824)		1,067		62 %	
Vehicle Expenses	(4,406)		(5,380)		974		82 %	
Wages & Employment	(58,644)		(61,097)		2,453		96 %	
FREIGHT	(333)		(300)		(33)		111 %	
FARM EXPENSES	(249,820)		(292,919)		43,099		85 %	
TRADING SURPLUS	15,832		(28,049)		43,881		56 %	
RUN-OFF EXPENSES								
Run-off Fertiliser	(33)		(3,167)		3,134		1 %	
Run-off regrassing			(898)		898		0 %	
Run-off R & M	(80)				(80)		0 %	
Run-off Admin	(3,900)		(3,900)				100 %	
RUN-OFF EXPENSES	(4,013)		(7,965)		3,952		50 %	
RUN-OFF SURPLUS	(4,013)		(7,965)		3,952		50 %	
GST								
GST	(71)		(1,849)		1,778		4 %	
GST	(71)		(1,849)		1,778		4 %	
INCOME (EXPENSE)	\$ 11,748		(\$ 37,863)		\$ 49,611		31 %	

Weekly Dataset from Lincoln University Dairy Farm

Date (Totals at end of period)	21-Sep-06	30-Sep-06	7-Oct-06	14-Oct-06	21-Oct-06
Total Cows Wintered (July 1st Total)	702	702	702	702	702
Farm grazing ha (available to milkers)	161.5	161.5	161.5	161.5	161.5
Dry Cows on farm / East blk / other	0/67/0	036/0	0/15/0	9/0/0	3/0/0
Culls (Includes culls put down & empties)	0	0	0	1	0
Culls total to date	6	6	6	7	7
Deaths (Includes cows put down)	0	2	1	0	0
Deaths total to date	10	14	15	15	15
Calved Cows available (Peak Number 680...)	619	646	666	672	676
Treatment / Sick mob total	9	6	7	2	3
<i>lame, mastitis, other, colostrum</i>	2/9/0/15	3/6/8/19	1/6/1/13	2/2/1/8	5/3/2/5
Milking twice a day into vat	581	609	621	657	645
Milking once a day into vat	2	0	8	0	10
Total Cows Milked into vat	583	609	629	657	655
Days in Milk actual cow days/Peak Cows	35	43	50	56	63
MS/cow/day (Actual kg / Cows into vat only)	1.72	1.9	1.98	1.91	1.85
MS/cow to date (total kgs / Peak Cows 680)	49	64	77	90	102
MS/ha/day (total kgs / Total ha used - eg 161.5ha)	6.20	7.3	7.7	7.8	7.50
MS/ha to date (total kg / Total ha used)	206	269	323.4	378	430
Monitor Group Cond'n Score	4.35			4.38	4.39
Monitor Group LW (kgs)	462			469.2	475.5
Soil Temp Tues 10.00am 10cm	8.5	11.5	11.1	11.1	10.4
Growth Rate (kgDM/ha/day)	52	54	62	62	80
Plate meter height - ave half-cms	12.1	11.6	12.0	12.0	11.9
Ave Pasture Cover (x140 + 500)	2200	2126	2179	2179	2173
Pre Grazing cover (ave for week)	4000	3100	3450	2600	2700
Post Grazing cover (ave for week)	1480	1450	1480	1450	1450
Highest pregrazing cover	4000	3200	3518	2670	2824
Area grazed / day (ave for week)	3.00	5.53	6.06	7.30	7.20
Grazing Interval	54	29	25	21	21
Pasture ME (pre grazing sample)	12.9	12.7		12.9	12.8
Pasture % Protein	22.7	20.8		19.2	19.7
Pasture % DM	19.5	19.2		18.4	19.5
Pasture % NDF	35.4	35.6		35.9	35.5
Supplements Type	0	0	0	Grass silage	Grass silage
Supplements fed kg DM/cow/day in pdk	0.0	0.0	0.0	5.5	4.4
Supplements fed to date kg per cow (680 peak)	0	0	0	26	61
Supplements Made Kg DM / ha cumulative	0	0	0	0	0
Units N applied/ha and % of farm	20 units,22%	0	0	20 units,50%	20 units,20%
Kgs/ha N to Date (excludes Italian & tetreploid)	45.0	49.0	49.0	56.0	59.0
Rainfall (mm)	2.6	0	67	0	0
ET Weekly Soil & Science readings (mm)	2.6	9.2	13.2	20.47	20 est
Days irrigated each week	0	0	0	0	2
Irrigation mm applied per week	0	0	0	0	12
Stock Water Consumed litres / cow / day	47	42	33	54	58

Profitable pasture renovation on LUDF

Graham Kerr, Rachael Robinson (Agriseeds), Adrian Vanbysterveldt (Dexcel)

Much pasture renovation is done in New Zealand each year, but results are seldom measured. The Lincoln University Dairy Farm (LUDF) has implemented a programme to look at pasture renovation and its results. This has three steps:

- Identify poor producing paddocks.
- Rectify reasons for poor production – by renovation.
- Monitor results.

How to identify poor paddocks

The t DM/ha each paddock grows varies widely. The best paddocks give an idea of the potential you can grow; the poorest paddocks need assessed as to why.

You can estimate paddock growth with pasture assessments on farm walks, or by counting how often each paddock is grazed. The LUDF has done both.

Example

A way to measure paddock grazings is to put up a sheet in the cowshed or office as in Table 1. Each time a paddock is grazed give it a tick. At the end of the season ticks are totalled. Add any other growth made it silage or grazed by colostrums/sick cows, to give the total grazings each paddock had. If paddocks are different sizes, you need to divide by the paddock size, to get grazings/ha.

In Table 1, Paddock A is producing much better, giving almost twice as many grazings as Paddock C.

Table 1: Example of Recording Grazings

Paddock	Grazings of Paddock	Plus Silage made	Plus colostrum sick/ cows	Total Grazings	Size paddock (ha)	Total Grazings/ha
A	✓✓✓✓✓✓ ✓✓✓✓✓✓ ✓✓✓✓✓✓		✓✓	20	4.0	5.0
B	✓✓✓✓✓✓ ✓✓✓✓✓✓ ✓✓✓✓	✓✓✓✓		20	5.0	4.0
C	✓✓✓✓✓✓ ✓✓✓✓✓✓			12	4.0	3.0

LUDF results of identifying poor paddocks

It is believed the LUDF grows around 20 t DM/ha each year. However, assessments indicate the best paddocks grow 23 t DM/ha, the worst 15 tDM/ha, i.e. a potential 8 t DM/ha gain from some paddocks.

The worst two paddocks on the farm, S1 and S10, were identified as follows.

Table 2: Paddock S1 (Renovated 2005/06)

How assessed	Estimated growth 2004/05	Comment
Grazing records	16 t DM/ha	From no of cows paddock fed.
Plate meter assessment	16 t DM/ha	From weekly plate meter walks.

For S1 there is good agreement between methods for growth assessment.

Table 3: Paddock S10 (Renovated 2004/05)

How assessed	Estimated growth 2003/04	Comment
Grazing records	10 t DM/ha	From no of cows paddock fed.
Plate meter assessment	16 t DM/ha	From weekly plate meter walks.

For S10 there is poor agreement between methods for growth assessment.

The paddock was estimated to grow 16 tDM/ha (by plate meter), but only 10 t DM/ha was eaten by cows, the more important figure. This is because S10 is very wet, heavy, Temuka clay that gets a lot of surface water. The poor drainage made it hard to utilise, particularly as a large paddock, furthest from the cowshed.

Rectifying reasons for poor performance

Paddock S1

Contained a lot of browntop, twitch and old Canterbury ryegrass, which were not growing well. To improve species S10 was sprayed and surface cultivated in September 2005, and sown into *Bealey* perennial ryegrass (28 kg/ha), with *Sustain* (2 kg/ha) and *Kotare* (2 kg/ha) white clovers and timothy (1 kg/ha).

Paddock S10

Had two issues. Firstly, it is heavy Temuka clay, gets very wet with a lot of surface water. As well as depressing growth, the poor drainage made it hard to utilise without damaging the soil. Secondly, there was a lot of browntop, twitch and old Canterbury ryegrass in the paddock, which were not growing well.

It was decided this paddock needed major drainage work to grow well, and re-contouring was undertaken during the 2004/05 season, with surface drains to improve surface runoff. (Sub-surface drainage is not effective on this soil.) The cost was around \$11,000 or \$1100/ha. To improve species S1 was sown in autumn 2005 into *Bealey* perennial ryegrass (28 kg/ha), with *Sustain* (2 kg/ha) and *Kotare* (2 kg/ha) white clovers and timothy (1 kg/ha), in autumn 2005.

Cost Benefit of renovation.

Paddock S1

Paddock S1 was out of grazing during September, October and part of November in the 2005/06 season. Despite this, the new pasture still produced 3-4 t DM/ha more than the previous year as in Table 4.

Table 4: Paddock S1 (Renovated 2005/06)

How assessed	Estimated growth 2004/05	Estimated growth 2005/06
Grazing records	16 t DM/ha	20 t DM/ha
Plate meter assessment	16 t DM/ha	19 t DM/ha

Table 5: Cost benefit renovation of S1

Cost	Benefit (↑ income)
\$550/ha	\$1160/ha FIRST YEAR ONLY
	\$5800/ha OVER 5 YEARS*
Spray glyphosate, graze, surface cultivation, drill seed, seed mix, broadleaf spray new pasture	Extra 3.5t DM/ha, converted to MS at 1 kgMS/12 kgDM = 290 kgMS/ha extra, @\$4/kgMS

* Five years is conservative. Pasture typically lasts longer.

Overall the cost involved in producing extra milksolids (MS) is lower than total costs of MS production, as fixed costs have already been met. Maybe you could estimate 30% of income as the marginal cost of extra MS production?

Assuming this, for a \$550/ha investment:

- The cost of renovation is recouped in 8 months.
- *In the first 12 months you make a 47% return on investment.*
(based on \$812 return (deducting 30% of \$1160 in costs))
- *Over 5 years you make a 700% return on investment.*
(based on \$4060 return (deducting 30% of \$5800 in costs))

Paddock S10

This example is more one of development than renovation, as major one-off costs were involved. The re-contouring work of S10 and resowing cost \$1500/ha. Through the process 5 t DM/ha growth was lost, which must be added to costs.

The grazing records show there has been a significant improvement, with an extra 11 t DM/ha eaten from the new pasture, as shown in Table 6.

Table 6: Paddock S10 (Renovated 2004/05)

How assessed	Estimated growth 2003/04	Estimated growth 2005/06
Grazing records	10 t DM/ha	21 t DM/ha
Plate meter assessment	16 t DM/ha	21 t DM/ha

Table 7: Cost benefit renovation of S10

Cost	Benefit (↑ income)
\$2660/ha	\$3670/ha FIRST YEAR ONLY
	\$18,300/ha OVER 5 YEARS*
Major contouring, drainage, cultivation, drill seed, seed mix, broadleaf spray new pasture = \$1500/ha. Plus loss of 5 tDM/ha growth = \$1160 in lost MS.	Extra 11t DM/ha, converted into milk at 1 kgMS/12 kgDM, = 916 kgMS/ha extra, @\$4/kgMS

* Five years is conservative. Pasture typically lasts much longer.

Overall the cost involved in producing extra milksolids (MS) is lower than total costs of MS production, as fixed costs have already been met. Maybe you could estimate 30% of income as the marginal cost of extra MS production?

Assuming this, for a \$2660/ha investment:

- The cost of renovation is recouped in 12 months.
- *Over 5 years you make a 480% return on investment.*
(based on \$12,800 return (deducting 30% of \$18,300 in costs))

Where to on the LUDF.

Renovation is highly profitable in the long term, so must be undertaken when necessary. The challenge for LUDF, and many other farms, is that in the short term, taking paddocks out of the grazing rotation for renovation can be a struggle.

There are two many strategies the LUDF are looking at.

Renovation during spring surplus

This will be used, as it has significant advantages over autumn renovation in reducing silage costs.

It is estimated that when renovating during spring about 3-4 t DM/ha pasture is lost (paddock not producing for 6 to 9 weeks). In a time of pasture surplus, this would have been made into silage. It is also estimated new pasture will grow an extra 7 t DM/ha in the same season, mainly in autumn when silage would have been fed out.

With spring renovation you can avoid making and feeding out the silage you have to with autumn renovation.

Spring sowing also gives faster establishment, particularly of clover, than autumn sowing.

Early spring renovation

This will happen when a poor paddock is identified for use as a sacrifice paddock in wet conditions, to protect the majority of the farm (this happened with S7 in spring 2006). If badly damaged and producing poorly, they will be renovated as early as possible.

Conclusions

- Identifying poor paddocks, and successfully rectifying them, to date been highly profitable on the LUDF.
- Payback of costs is happening in 8-12 months.
- The LUDF will continue renovation as necessary, targeting the time of spring surplus (late October – December) to reduce silage costs.
- Early spring renovation (September) will be used where an identified sacrifice paddock had been badly damaged and is producing poorly.

Forages for SIDDC Dairy Support Land Project

Derek Wilson, Shane Maley, Sam White, Crop & Food Research; Grant Edwards, Lincoln University

Background

A new forages project was started in autumn 2006 as part of the larger “Sustainable productive support land for South Island dairying” project, funded by the Sustainable Farming Fund. . Its aims are:

- To demonstrate feed production systems based on forage crops and evaluate them as alternatives to pasture.
- To demonstrate production of forage crop options that will provide a range of feed alternatives in terms of timing, production patterns and quality – to fill production gaps during the milking season and provide winter feeds for dry cows.
- To develop and demonstrate best management practices that will maximise yield and quality of each crop, optimise environmental protection and nutrient balancing, and maximise feed utilisation during grazing.

To start the project, forage crops were established on the Lincoln University Dairy Farm in autumn 2006, with the following aims:

- To demonstrate two forage cropping sequences in a two-year pasture-to-pasture renewal system.
- To maximise yield and quality by using best management practices on all the crops.
- To produce at least 22 t DM/ha per year in both systems.
- To compare the effects of grazing in very wet and drier conditions during winter on soil quality and the performance of subsequent crops and pasture.

In the future, the project will be extended by adding larger-scale studies of production, utilisation and impacts of cropping sequences and grazing management during pasture renewal at other sites in the South Island’s dairying regions.

2006-08 Project Details

- Forage crops were established in March 2006 in two 0.7 ha blocks on the east block of the Lincoln University Dairy Farm.
- The areas were ploughed out of long-term pasture, and there will be two cropping sequences in a two-year pasture-to-pasture renewal system:
 - Area 1:
 - Sow single-graze oats in early March 2006.
 - Graze the area in June 2006; expect about 4000 kg/ha. Before grazing, split the area in two and irrigate one half to compare the effects of grazing in wet and drier conditions. Direct-drill a second oats crop in July-August 2006.
 - Harvest for green-chop silage in November 2006; expect about 9000 kg/ha.
 - Sow kale in November 2006.
 - Graze the kale in June 2007; expect about 16000 kg/ha. Irrigate one half before grazing and compare the effects of grazing in wet and drier conditions.

- Sow barley in July-August 2007.
- Harvest for whole-crop silage in December 2007; expect about 14000 kg/ha.
- Sow new pasture in autumn 2008.

- Area 2:
 - Sow multi-use triticale in early March 2006.
 - Graze the area in May 2006; expect about 2000 kg/ha and leave 1000 kg/ha residual.
 - Graze the regrowth in late July; expect about 1500 kg/ha and leave 500 kg/ha residual. Before grazing, split the area in two and irrigate one half to compare the effects of grazing in wet and drier conditions. (See the “Grazing management plan” below for more details).
 - Harvest the two halves for silage in late December 2006; expect about 16000 kg/ha.
 - Sow turnips in December 2006.
 - Graze the two halves in March 2007; expect about 8000 kg/ha.
 - Sow single-graze oats in April 2007.
 - Graze the oats in July 2007; expect about 4000 kg/ha. Irrigate one half before grazing and compare the effects of grazing in wet and drier conditions.
 - Sow barley in July-August 2007.
 - Harvest for whole-crop silage in December 2007; expect about 14000 kg/ha.
 - Sow new pasture in autumn 2008.

- In all cases the following will be measured:
 - Feed production; measure dry matter in both halves of each area before grazing.
 - Feed quality; measure quality attributes of pre-grazing dry matter samples.
 - Feed utilisation during grazing; measure the residual in each area after grazing.
 - Effects of grazing during wet and dry conditions:
 - Measure soil quality before and after grazing.
 - Compare the establishment and performance of the subsequent crops.
 - Nutrient budget.
 - Evaluate the economic performance of each system.

Lincoln University Dairy Farm - Farm Walk notes

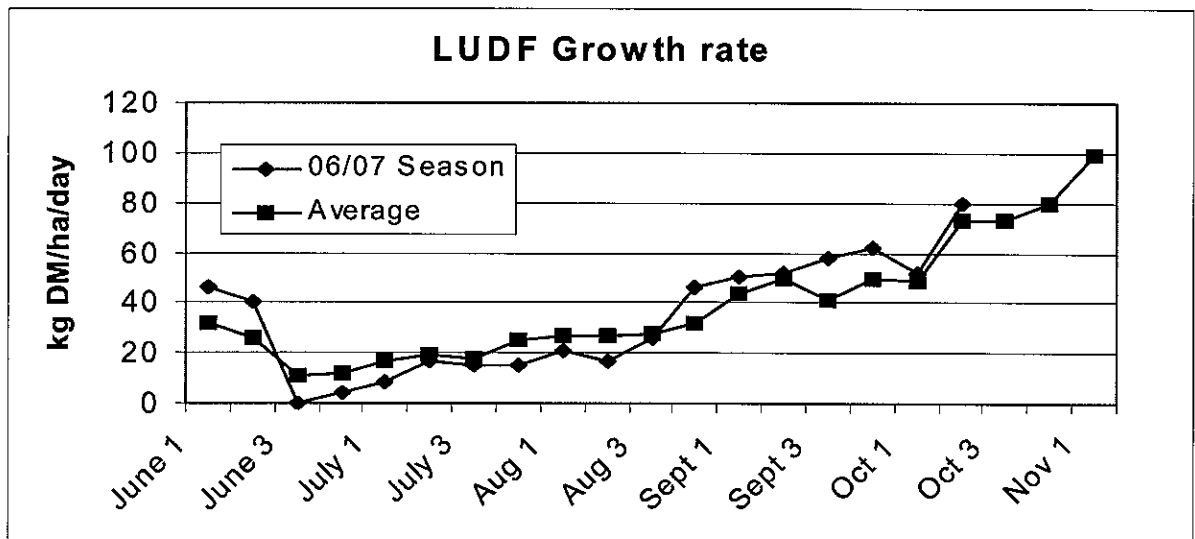
Tuesday 17th October 2006

Critical issues for the short term

1. Maintaining cow energy intake through mating

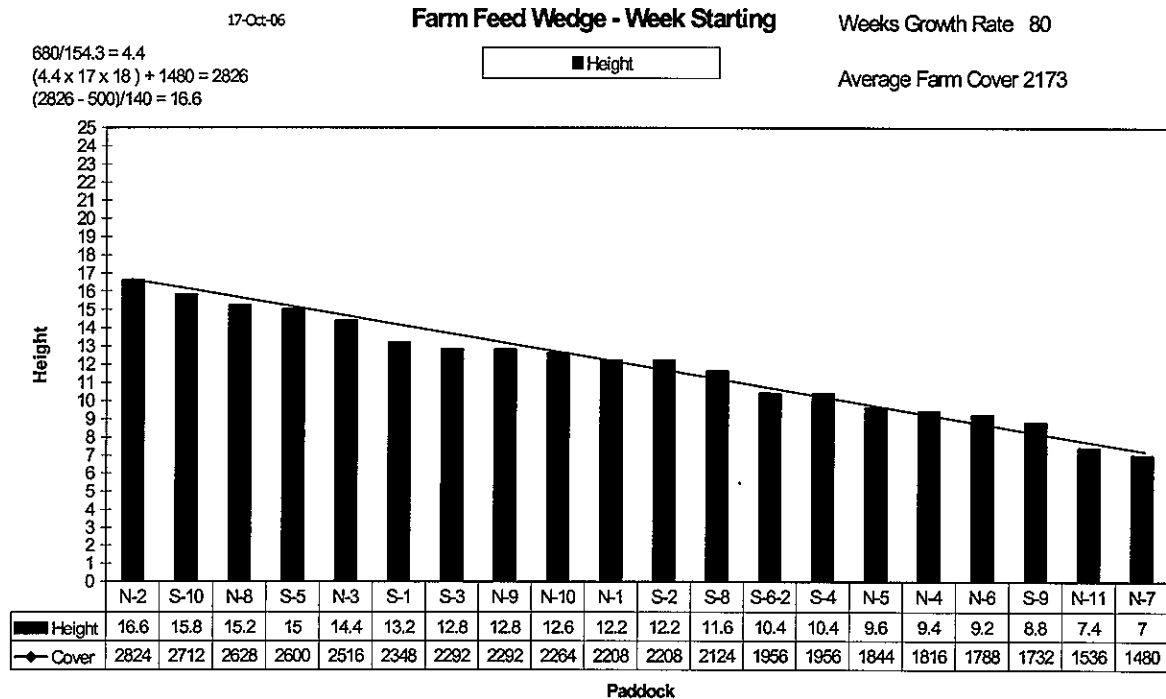
Summary of Key Factors affecting Grazing Management & Animal Performance

2. SOIL TEMPS have declined in recent days to 10.4 down from over 13 degrees during the week and are still up on the previous week.



3. Weather forecast for the next 12 days is for mild to warm which leads to expect that our growth rate will be similar to last week. Soil temperatures are starting off a degree higher and the weather pattern is similar to this last week so we expect growth rates to be at above the average for the second half of October.
4. PASTURE GROWTH over the last week rose to 80 kg DM/ha (last week 52) and close to the average growth for this time of the year. However October can be a cruel month with wide fluctuations in growth rates.
5. Over the last week we have been holding the round at 1/22nd of the farm a day to allow covers to lift from last weeks low of 1900. The average cover has lifted to 2173. We fed out an average of 5.5 kgs of DM of grass silage /cow to assist with this.
6. Despite the feeding of grass silage Milk PRODUCTION has dropped and the last 5 days average was 1.85 kgs MS/cow/day (down from 1.98 kg MS/cow), and 7.6 kgs MS/ha/day (down from 7.9 kg MS/ha/day).
7. The drop in production was more than we expected and may be related to the fact that almost 1/3rd of the cows diet was 10.5 ME silage rather than 13 ME grass. We

had excellent utilisation of the grass silage, so the drop in production is showing that the cows were still fed below optimum for maximum milk production.



8. The calculations above the top left of the wedge are to calculate the pre-grazing cover. The first line calculates the actual stocking rate on the milking area. The second line (Stocking Rate x intake x rotation length) + target residual = pre – grazing target. The third line converts this to height (in compressed half centimetres).
9. The wedge indicates that we have sufficient pasture to maintain an 18 day rotation length. We will need an average growth rate of 80 kgs DM/ha /day to be able to sustain this faster rotation length. It is our call that this is likely to occur.
10. The FEED ALLOCATION to the milking herd will be held at 17 kgs DM/cow/day. This will again comprise all grass.
11. We are continuing to follow the cows with 20 kgs N/ha. ie 6 - 7 paddocks each week.
12. The contractors have today cut the first batch of grass for silage that we are purchasing off-farm for the autumn. We are targeting 70t of silage of above 12 ME through cutting an early light crop. Weather conditions look very favourable for excellent wilting. The silage will be made into medium square bales.

13. The yearling heifers have had their synchrony program and 38 were mated on day one, 81 on day two, and the final 56 on day three. Only 20 of the yearlings mated on day three actually had an observed heat. Jersey bulls (to a ratio of 1 bull/30 yearlings) were joined with the yearlings later I on day three of mating.

Note

Next SIDDC Focus Day at LUDF is on Thursday the 26 October.

The next WEEKLY farm walk is on **TUESDAY 24th October 10.00am.**

Management Group

Peter Hancox (Farm Manager) Peter Gaul (for SIDDC) and Adrian van Bysterveldt (Dexcel)