



Providing knowledge

St Peter's School/Lincoln University
Demonstration Dairy Farm



ST PETER'S • CAMBRIDGE
NEW ZEALAND



**Lincoln
University**
Te Whare Wānaka o Aoraki
AOTEAROA • NEW ZEALAND

New Zealand's specialist land-based university

Farm Focus Day

Wednesday, 23 May 2018

PROVIDING KNOWLEDGE

Owl Farm Season Update: Less milk, more profit, better environmental results.

Financial Review: How does the cashflow look so far?

Fertiliser Focus – Value added stage by stage

Feedback session – on your phone browser visit kahoot.it

Wi-Fi access today – Find StPeters-Guest - **Password** - FarmFocus





HEALTH AND SAFETY

Welcome to Owl Farm. We are a fully operational, commercial dairy farm with a number of potential hazards to both visitors and staff. Many of these potential hazards cannot be eliminated while also providing access to visitors therefore all staff and visitors **MUST** watch for potential hazards and act with caution.

St Peter's School / Owl Farm Hazard Notifications

- Children are the responsibility of their parent or guardian
- Normal hazards associated with a dairy farm
- Other vehicle traffic on farm roads and races
- Races may be slippery

ARE YOU TRAINED FOR WHAT YOUR ARE ABOUT TO DO? If not, STOP.

Emergency Contact Information

In the event of an emergency, ensure the scene is safe and raise the alarm to get Owl Farm staff and emergency services to assist.

Emergency Services

- Fire, Police and Ambulance **111**
1716 Cambridge Road, Follow Hanlin Road through the school to the farm

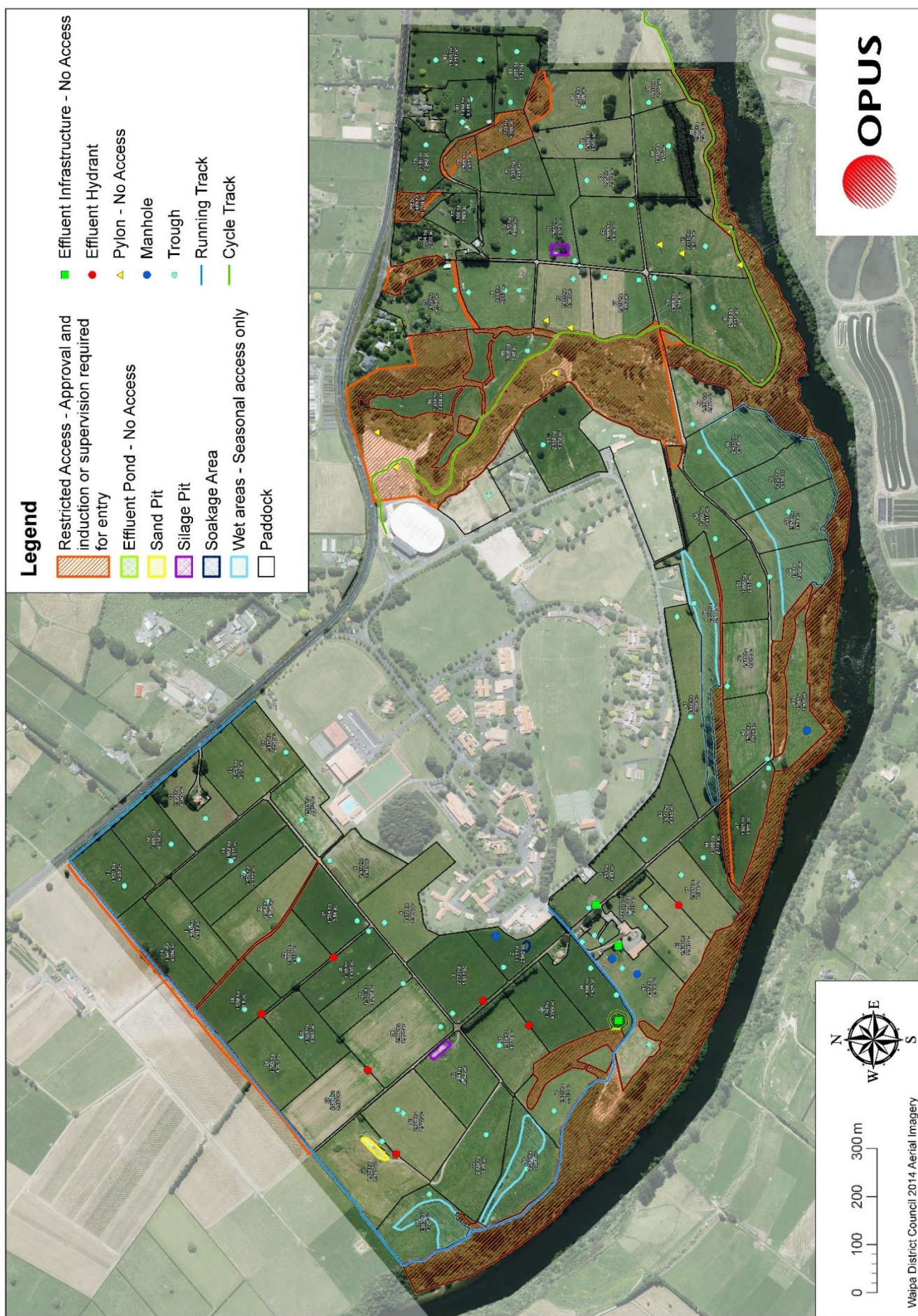
Farm Staff

- Louise Cook – Demonstration Manager 027 808 5777
- Tom Buckley – Farm Manager 021 058 4916

Safety Equipment Location

- First Aid Kits Dairy Shed and Vehicles
- Fire Extinguishers Dairy Shed and Tractor
- Defibrillator Main Office and St Peter's Medical Centre

By entering Owl Farm and signing in at registration, you are acknowledging your understanding of any potential hazards and agree to take personal responsibility and act in such a manner as to protect yourselves and others also on-farm.





St Peter's School/Lincoln University
Demonstration Dairy Farm



OWL FARM - ST PETER'S SCHOOL / LINCOLN UNIVERSITY DAIRY FARM STRATEGY

1. Vision

a. Dairy Farm

- To apply proven research, utilising good on farm practice and scientific monitoring for the farm to become an exemplar in dairy production, financial, environmental and people performance, while maintaining the highest standards of health and safety.

b. Students

- To encourage more young people into the dairy industry.

2. Strategic Objectives

a. Dairy Farm

- Providing leadership to dairy farmers and the wider community by demonstrating progressive practices that can be achieved on farm.
- Optimise profit through identifying the appropriate dairy production system for Owl Farm.
- Achieving a farm sustainable environmental footprint based on industry good management practice.
- To attract, train and retain quality employees.

b. Students

- To provide educational opportunities and exposure to the dairy industry which demonstrates career opportunities to students.

3. Farm Development Stages

a. Stage 1 Objective (2015/16 – 2017/18)

Establish credibility by addressing current issues and performance, whilst setting up the farm for future development. During this stage, the farm will operate a pasture based system, with tactical supplementation strategies, based largely on existing infrastructure, to optimise profit while developing a resilient farm system.

b. Stage 2 Objective (2018/19 – onwards)

Testing and investigating in conjunction with partners, innovative strategies to lead sustainable profit. The farm system will be developed over years 1-3 and reflect demonstration requirements of industry that are relevant and appropriate at that time point.

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OWL FARM SNAPSHOT

	Year	2015-2016	2016-2017	2017-18 forecast
Physical Info	Total Farm Area	177	172	171
	Effective Area	151	146	148
	Effective area Leased	23	18	18
	Leased Run off	3	7	5
	Cows Wintered	470	453	432
	Peak Cows (1Dec)	445	423	418
	Peak Stocking Rate Cows/ha	2.95	2.90	2.84
Production	Total kgMS	176,197	178,294	168,169
	MS/cow	396	421	402
	MS/ha	1,167	1,221	1,136
	MS/ha from homegrown feed	868	945	951
Feed and Inputs	Feed Grown TDM/ha	13.9	14.2	17.4
	Feed Harvested TDM/Ha (actual kgs)	11.9	12.2	12.9
	Feed harvested TDM/ha (@11.0MJME/kgDM)	12.4	12.8	13.7
	Supplements Imported TDM/Ha	4.2	3.6	2.3
	Nitrogen Applied/effective ha	149kg	167kg	150kg
Financials	FWE/kgMS	\$4.97	\$4.12	\$4.15
	OPEX/kgMS (incl deprn & feed inventory adj)	\$4.91	\$4.80	\$4.39
	EFS/ha actual payout (\$3.90/\$6.15/\$6.55)	-\$144	\$2,691	\$3,495
	EFS/ha @ \$6.00 farmgate milk price (no Div)	\$1,507	\$1,964	\$2,315
	Opening Debt/kgMS held	\$20.00	\$23.02	\$21.23
Statistics	Cowshed	36 Rot	36 Rot	36 Rot
	Feed infrastructure	NIL	NIL	NIL
	Herd Figures	BW 162/189 PW	BW 107/128 PW	BW 112/135 PW
	Industry BW/PW	BW 110/122 PW	BW 64/73 PW	BW 64/73 PW
	Effluent Storage	Clay lined pond	Clay lined pond	New lined pond
	% farm effluent applied to	44Ha 29%	51Ha 35 %	54Ha 36%
	Soils are a mix of Clays and Sands, on largely flat terraced contour Operational regrassing via crop and regrassing ~ 10-15% per year 3 permanent staff members are employed - with no relief staff required to cover time off or calf rearing duties.			

2017-2018 SEASON SNAPSHOT



NOTES

REFLECTIONS ON THE YEAR – TOUGH ONE, BUT SURPRISINGLY REWARDING

We're proud of

Improving our Profit

Strong Team - always developing

Winter -Spring performance

Improving our Environmental output

Sticking to First principles after summer

We've learned

November - Make the silage

Tom is important to look after too...

BCS at mating was an issue

DAP down the spout & direct drill grows great crops

We can't control everything.

We're keen to

Know and manage our BCS better right up to mating

Have a large leak-free pond, more effluent options

Have key tasks being done by more than 1 person

Aggressive strategies to ensure summer pasture quality

Decide on our future farm system and move forward!

NOTES

SEASON TO DATE

	Year to date 23/03/18	2015-2016	2016-2017	2017-2018	Notes
Stock	Milking Platform	160	146	148	
	Cows on farm	454	432	420	
	Peak cows	445	423	418	
	Cows calved	460	425	420	
	Stocking rate on farm	2.84	2.96	2.84	1
Production	Total kgMS Season to date	176,197	178,294	168,169	2
	MS/cow Season to date	396	421	402	
	MS/ha Season to date	1,101	1,221	1,136	
	MS/ha from homegrown feed to date	894	952	971	3
Feed and Inputs	Average Pasture Cover 1 June	2,142	2951	2256	4
	Pasture Cover at 23 May 2018	2,805	2272	2442	
	Pasture grown TDM/ha	14.6	14.1	17.4	5
	Reduction in APC TDM/ha	0.1	0.9	0.2	6
	Crop grown/ha	1.0	1.4	0.8	
	Imported Supplements fed/ha	4.0	3.6	2.3	
	Total Feed supply TDM/ha	19.8	20.0	20.7	7
	Homegrown grass eaten TDM/Ha (grown this year)	10.5	9.7	11.1	
	Crop eaten per total farm/ha	0.9	1.2	0.7	
	Silage harvested TDM/ha Season to date	0.0	0.6	1.1	
	Reduction in APC TDM/ha	0.0	0.7	0.0	
	Homegrown feed Harvested TDM/ha	11.4	12.2	12.9	8
	Feed Harvested TDM/ha (11.0MJME/kgDM)	12.4	12.8	13.7	9
	Imported Supplements Eaten TDM/ha	2.8	2.5	1.8	
	Total Feed eaten/ha	14.2	14.8	14.8	
	Feed Eaten TDM/ha (11.0MJME/kgDM)	15.5	15.3	15.5	
	Feed conversion Eff (kgDM/kgMS)	12.9	12.1	13.0	
	Nitrogen Applied/effective ha	156	167	150	
Inventory feed T DM	Homegrown silage/hay	40	58	124	
	PKE in budget	15	0	10	
	Bought silage hay	62	48	35	
	Maize silage	228	37	0	
	Total supplements on hand	345	143	169	10

NOTES

Owl Farm Numbers – Seasonal Update

“WINTER RESET”

End of season stocktake

1. With the heifers home we are currently running a slightly lower stocking rate than at the same time last year (9 surplus cows to cull still under withholding in 2017).

Milk Matters

2. We completed the season down 5.7% or 10,000kgMS. This was however only 3,000kgMS behind our budget figure as we changed from system 3 with 220TDM of Maize Silage, to System 2 without the Maize this season.
3. This is reflected in the increase in milk from homegrown feed this year. A challenging and often frustrating summer saw large volumes of increased feed, but poor quality and heat stopped that getting converted to milk. However, we're still pleased to see this trend increasing, and we hope to soon crack 1,000kgMS from homegrown feed (compare to a no-input farm, producing 1.000kgMS/ha).

Summary of the pantry this season

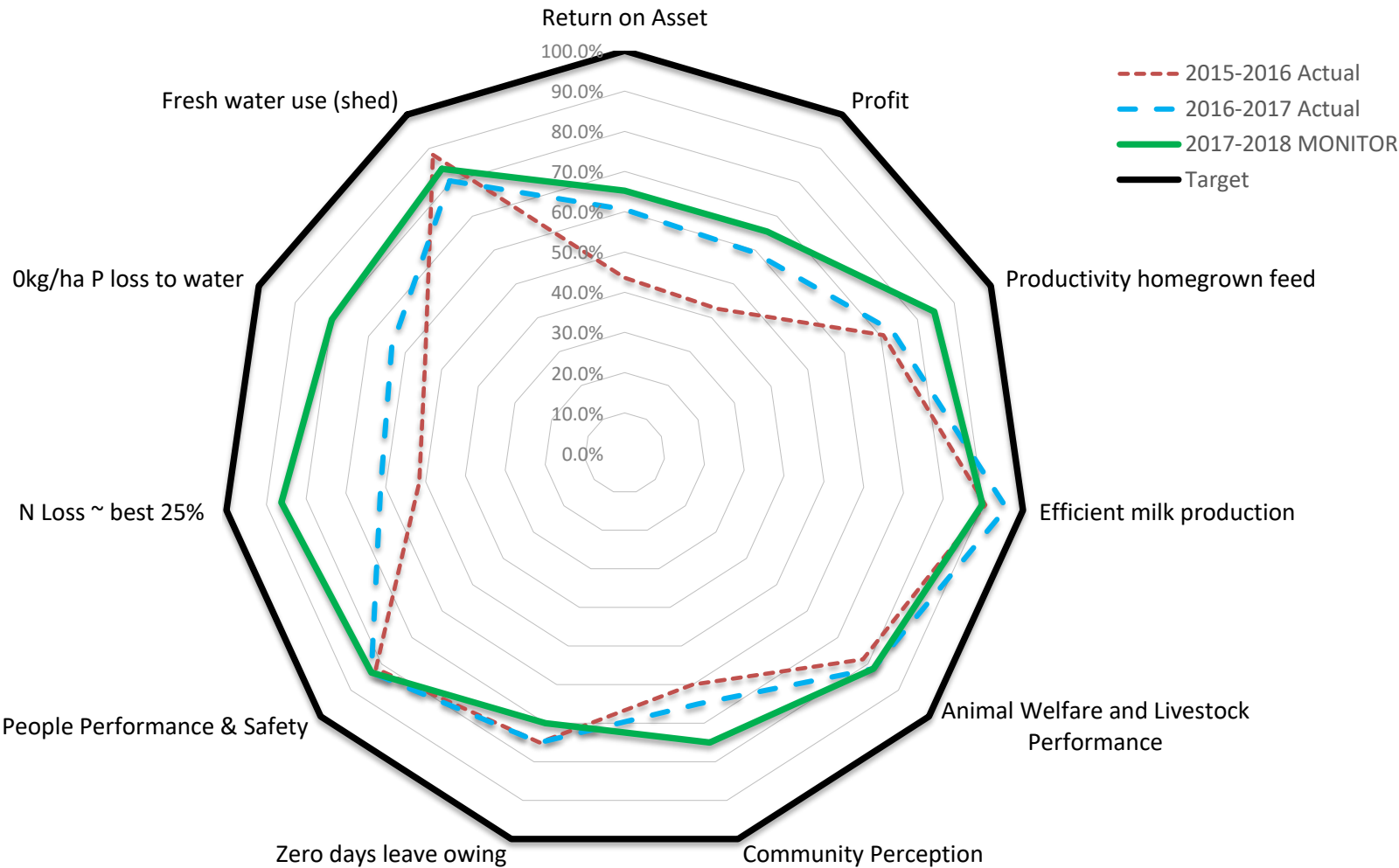
4. Feed Inventory on hand and Pasture cover change between the open and close of the season is a good barometer on repeatability. This year we have lifted our APC at end of season to target, something not achieved last year. This gives us confidence in performance for the coming season.
5. We have grown a staggering 3.3TDM/ha more than last year based on growth rates throughout the season. However, 1.5TDM of this was in January and February after incessant summer rain. Sadly this feed was worse-than-average quality. The 1.5TDM extra grown before Christmas is a really positive sign and one we hope to maintain in the coming season.
6. Part of the 2016-17 season production came from eroding a very high 1 June pasture cover down to 1,950kgDM/ha by Balance date and then subsequently NOT getting back to 2,500kgDM/ha at the end of season. It was home grown feed, it made milk, it does however make the season appear more successful than it really was.
7. The total feed supply to date shows a more futuristic look at the Owl Farm feed budget moving forward. We're pleased to see total feed supply maintained, but with more of it coming out of our ground..
8. Total homegrown feed eaten is only up 0.7TDM/ha despite 3.3TDM/ha more being grown. The four causes of this 2.6TDM/ha discrepancy are:
 - a. Utilisation of feed more accurately reflected this year in data (we likely grew more in 16-17 than we recorded), 0.9TDM/ha
 - b. Utilisation of feed worse in some parts of the year for climatic reasons predominantly the wet September, and hot low quality January and February months requiring a lot of topping to waste 0.6TDM/ha
 - c. The high winter pasture cover and low closing cover from (note 6 above) cheekily lifts the 16-17 feed eaten relative to grown by 0.7TDM
 - d. Extra pasture cover on hand at closing this year relative to opening means we have roughly 300kgDM/ha on farm in Pasture cover inventory – but not harvested! 0.3TDM/ha.
9. For Benchmarking purposes we convert the season total feed harvested/ha in TDM through to the TDM equivalent of 11.0MJME/kgDM feed. That means this year we increase our homegrown feed harvested to 13.7TDM/ha.
10. We head to winter with a healthy winter feed budget and an extra 30TDM of feed on hand than last year. This means in addition to producing the milk we have lifted cover from open to close and lifted feed inventory. Both a welcome change over the last season where both dropped.

NOTES

OWL FARM SEASON PERFORMANCE ON OUR SCORECARD

Our wagon wheel works best when we have a round wheel. This year we have taken out some of the angles and made real progress in some areas. But we know there is more to work on.

The green series is this year, blue dashed, last year and Orange dotted the prior year. The closer to the black line we get, the closer we are to our goals



BIOSECURITY

Start by starting.

We must take steps to protect the farm from all diseases and pests/weeds that may create business interference or interruption.

Tell our visitors that we need them to help us protect our farm.

Provide clean and safe facilities for them to comply with our requests.

Be consistent with expectations.

No exceptions!



QUESTIONS WE MUST ANSWER MOVING FORWARD:

- How do we manage stock exposure via trucking of replacement animals?
- What risk do bulls pose at mating for heifers and cows?
- What risk is present at our external grazier?
- How do we manage exposure from trucks that collect calves from the farm for sale at stockyards or processors?
- What vehicles can still drive around our farm paddocks?
- What risk do bulk spread, silage or drilling contractors present to animal disease and weed seed?
- How can we de-contaminate them?
- What is the cost of doing it, that we must plan to incur?
- What safety risks are created from biosecurity protocols? (slippery footwear on shiny surfaces)
- What haven't we thought of?

NOTES

FINANCIAL PERFORMANCE

To 30 April	2015-16	2016-17	2017-18	Variance	Notes
Production	173,940	176,576	166,981	(9,595)	Down over Summer months (feed type/quality)
Revenue	\$760,738	\$1,013,347	\$1,017,926	\$4,579	
Operating Expenditure	\$807,056	\$761,129	\$726,269	(\$34,860)	
Operating Profit/(Loss)	(67,868)	\$227,364	\$264,093	\$36,729	
Milk price received	\$3.47	\$4.90	\$5.28	\$0.38	
Total revenue/kgMS	\$4.37	\$5.74	\$6.10	\$0.36	
FWE/kgMS	\$4.04	\$3.94	\$3.98	\$0.05	
Opex/kgMS	\$4.64	\$4.31	\$4.35	\$0.04	
Profit/kgMS	(\$0.39)	\$1.29	\$1.58	\$0.29	
To 30 April		2016-17	2017-18	Variance	Variance
Total Milk revenue from payout first 166,981kgMS	\$579,687	\$817,828	\$881,650	\$63,822	Higher advance rate on the first 166,981kgMS this year
Reduced revenue from less - 9,595kgMS	\$24,158	\$46,994	\$0	(\$46,994)	Reduction in Revenue from less milk YTD
Reduced dividend	\$70,687	\$77,250	\$60,002	(\$17,248)	Reduction in Share dividend paid
Livestock sales	\$86,206	\$71,275	\$76,274	\$4,999	Additional cull cows sold
Animal Health Costs	\$32,664	\$43,490	\$34,345	(\$9,145)	No spend on Eczema bolus, dry off earlier
Feed	\$190,417	\$157,338	\$136,243	(\$21,095)	Less bought in feed used, less crop costs
Fert & spreading	\$95,329	\$87,487	\$79,539	(\$7,948)	Less N and cropping fert required

ANIMAL HEALTH SPEND

Our Animal Health Spend has always been a thorn in our side – but the first step in solving the issue is understanding it. Tom has had a deep dive into our spend and broken out WHAT we spend on and HOW MUCH on each item. Industry data reliably tells us we are above average, but has no further detail on where precisely it is. The following table breaks down the spend, with some notes to guide. Compare your figures to ours and share back with us! We'd love some help on finding the improvements, by seeing what others spend.

Item	Total	\$/cow	\$/kgMS	Your Figures
Vet BCS April	347	0.83	0.00	
Bloat oil	1,676	4.01	0.01	
Blood tests	1,434	3.43	0.01	
Heifers/calves/BVD	3,248	7.77	0.02	
Feet	1,273	3.05	0.01	
Metabolic Preven	4,835	11.57	0.03	
Metabolic treat	659	1.58	0.00	
Metrichheck	2,539	6.07	0.02	
Salmonella/Abscess	706	1.69	0.00	
Eczema - zinc	3,034	7.26	0.02	
Metricure/peccary	440	1.05	0.00	
Trace minerals	3,718	8.89	0.02	
Brassica Scald	201	0.48	0.00	
Neospora test	434	1.04	0.00	
Udder health/Teatspray	5,425	12.98	0.03	
Mastitis drugs	4,989	11.94	0.03	
Dry Cow/teat seal	8,300	19.86	0.05	
Lepto Vacc	623	1.49	0.00	
May bills due TBC	2,276	5.44	0.01	
Grand Total	46,157	110.42	0.27	0

So far it's clear that Mastitis – prevention and treatment is a big part of the spend and with 158 treatment cases this year (including some, not-clear re-treat, repeat cows, or drug changes) we need to focus on this.

NOTES

Cambridge Vets have taken a sample for an Antibigram to identify what bacteria we have and make sure we have the best default drug regime. Addressing the performance of teat spray unit is on the winter checklist, and deferring wind impact. Plus a plan to assess milking technique, plant performance and udder health when we get into spring next year.

We think we can make our trace elements more cost effective, so that adds some more savings.

The table below shows our Farm Working Expenditure (ex GST) YTD for comparison with your own data.

FARM WORKING EXPENDITURE COMPARISON

<i>Measure - TO 30/04/2018</i>	Total	/ha	\$/cow	\$/kgMS 2018	\$/kgMS 2017	Your figures
<i>Total volume</i>	Total	148	418	166,981	176,576	
<i>Milksolids KG</i>	166,981	1,128	399			
<i>Total Labour Costs</i>	136,228	920	326	0.82	0.79	
<i>Animal Health</i>	42,409	287	101	0.25	0.29	
<i>Calf Rearing</i>	2,506	17	6	0.02	0.00	
<i>Breeding</i>	39,420	266	94	0.24	0.23	
<i>PKE</i>	58,651	396	140	0.35	0.20	
<i>Grass Silage Harvested</i>	30,650	207	73	0.18	0.15	
<i>Purchased silage</i>	22,758	154	54	0.14	0.07	
<i>Maize Silage fed adjustment</i>	3,081	20	7	0.00	0.29	
<i>Cropping</i>	17,137	116	41	0.10	0.14	
<i>Feed Sampling</i>	1,208	8	3	0.01	0.00	
<i>Calf Meal</i>	5,839	39	14	0.03	0.03	
<i>Fertiliser Spreading</i>	3,834	26	9	0.02	0.02	
<i>Fertiliser - Maintenance</i>	27,435	185	66	0.16	0.18	
<i>Fertiliser - Nitrogen</i>	40,422	273	97	0.24	0.24	
<i>Freight</i>	7,848	53	19	0.05	0.05	
<i>Re-grassing</i>	32,000	216	77	0.19	0.17	
<i>Heifer grazing costs</i>	61,449	415	147	0.37	0.32	
<i>Shed Expenses</i>	6,403	43	15	0.04	0.07	
<i>Electricity</i>	13,540	91	32	0.08	0.07	
<i>Water Charge</i>	16,529	112	40	0.10	0.07	
<i>R&M - Land & Buildings</i>	22,649	153	54	0.14	0.13	
<i>R&M - Plant & Equipment</i>	14,319	97	34	0.09	0.07	
<i>Vehicle Maintenance</i>	7,577	51	18	0.05	0.05	
<i>Petrol/Diesel</i>	6,970	47	17	0.04	0.04	
<i>Weed & Pest Control</i>	956	6	2	0.01	0.00	
<i>Other Expenses</i>	5,908	40	14	0.04	0.07	
<i>Rates/ACC/Insurance</i>	37,660	254	90	0.23	0.21	
<i>Total Farm Working Expenses</i>	665,385	4,496	1,592	3.98	3.95	

2018-19 BUDGET AND FARM PLAN

The farm system this year without large amounts of bought in feed, and with a slightly lower stocking rate has improved our profit, and driven a continued focus on homegrown feed. What the system did lack, was flexibility in post-christmas feed options and surety of feed budget into the autumn for weight gain, production and building winter cover.

Buying more feed in would be a step backwards and threaten the profit margin on feed which is always at risk. A return to large volumes of Maize silage needing to be fed throughout late Autumn, winter and spring would also undo, all the good we've done so far in system and pasture performance.

NOTES

Does this fit with our previous decision making matrix, and with our wagon wheel goals?

If we follow clear guidelines, it will be grown cheaply and used reasonably efficiently which will add to our profit. It will increase our homegrown feed harvested. It will enable greater milk production/cow and/ha. It will give greater flexibility in feed planning meaning we can step away from trying to drive feed ahead through summer when it was to the detriment of pasture quality. It will have little negative impact on environmental figures if we adhere to our “direct drill/minimum till” philosophy

But, there is a window in summer and early autumn, when ground conditions are favourable, and we have crop paddocks available where re-introduction of homegrown Maize silage may add a useful carbohydrate source to our Summer production. With a guaranteed bank of high quality feed, grown at home at least cost we can further improve our profits in our current farming environment.

The table below compares this year’s Full year budget versus our choice to grow and feed 5ha of Maize on farm both BEFORE we add in costs that could/would affect any year and do not represent profitability of the farm system.

Then we add those in to show what we believe will happen to our total farm profit: E.g. PKE price, milk price, return to maintenance fert, change in dividend etc. shown in Yellow

In short – a fair crack at the season and the use of homegrown maize in summer adds up to \$30,000 more profit to the bottom line.

Unfortunately, other forces conspire to drag profit down. Note, this is a summary budget and doesn’t show all line items, just ones with change between years.

Item	2018 forecast	2019 no price changes	2019 with known changes	Notes
Payout/kgMS Exc div	6.51	6.51	6.25	.
Milksolids KG	168,146	174,488	174,488	More milk with more Maize and quality over summer
Total Milk Receipts	1,094,190	1,136,217	1,090,550	Budget \$6.25 exc div
Dividends Received	55,800	55,800	65,100	Budget .35c wet share
Cattle Sales	91,535	69,335	69,335	Less culls to sell, lower calf price
Total Income	1,241,525	1,261,352	1,224,985	Total Income up \$20,000 exc payout change
Total Labour Costs	149,224	149,224	159,002	Extra relief labour and some wage adj
Animal Health	46,159	40,693	40,693	Target under \$100/cow
Zinc boluses	0	0	12,000	Zinc bolus provision
Total Cow Costs	88,417	82,464	94,464	.
PKE	58,653	64,673	64,673	One more load than this year purchased
PKE price change			16,947	Increase price - est \$265 on farm/T
Grass Silage Harvested	30,650	18,000	18,000	Less grass silage harvested
Maize silage	3,080	18,160	18,160	Gorw 5Ha maize, sow and harvest (no fert)
Purchased Silage	24,103	16,260	16,260	Less run-off area to harvest, less bough baleage
Summer Crop	17,137	11,545	11,545	8ha not 11ha turnips
Total Feed costs	139,123	139,301	156,248	
Maintenance Fertiliser	24,106	24,106	24,106	same current fert use
Extra maintenance Fert			12,207	Budget for more P & K as noted
Cropping fertiliser	3,329	11,696	11,696	Includes Maize fert, Turnips and DAP new grass
Fertiliser Spreading	3,834	6,112	6,112	More P, more lime to be spread + Maize
Fertiliser & Nitrogen	79,539	90,484	102,691	
Total Feed/Fert costs	250,662	251,684	280,838	
R&M Total	54,457	47,649	47,649	Less pond emptying
Vehicle and fuel	32,594	35,269	35,269	Fuel increase, older bikes
Total General costs	116,476	117,203	117,203	
Total Overhead costs	47,262	46,762	46,762	
Total Farm Working Expenses	715,165	711,129	762,060	
FWE/kgMS	4.23	4.08	4.37	
EFS	473,381	497,244	409,946	
Interest - Farm Loan	169,272	169,272	186,162	Increasing rates - start fixing
Interest and Lease	222,251	222,251	239,141	
Breakeven price	4.91	4.83	5.16	
Net Profit before tax	268,727	293,590	189,402	
EFS/ha	3,199	3,360	2,770	
EFS/ha at \$6 no div	2,245	2,379	2,035	

NOTES

VALUE ADD STAGE BY STAGE - FOCUS ON FERTILISER

Ballance is one of the founding partners of OWL farm.

The approach we have taken is: crawl, walk then run.

In the crawl stage there were some fundamental things to get in place and then we moved into the walk phase to refine and adjust but also helped a lot in the future farm system discussions including helping with nutrient budgeting to get numbers on the table.

Some of the key things refined and implemented:

1. Move from 2 or 3 blocks to 7 blocks and the lease area
2. Moved soil testing from September to March to better fit in with our main planning cycle
3. Added Total N to the soil test analysis
4. Evening up the base fertility levels especially pH (but also P which was needing a boost in some places and could be mined in some others)
5. Initiated herbage testing in Spring (quality and MicroNutrient assessment) and other times as diagnosis. Low Se levels found in the initial samples so immediate remedy was needed especially with young stock.
6. Together completing nutrient budgets to help guide fertiliser and environmental decisions.

Fertiliser recommendations in the last 24 months have focussed on correcting low pH, normalising K levels, frugal use of P, Owl farm's conservative approach to N use, and have increased the amount of S (cheapest nutrient and most mobile in very wet periods).

At OWL farm we have used fertiliser products that match the need and are convenient. In many cases these have multiple nutrients in them which are needed that time of year. These making spreading much more simple

N-Guru, a software program that is designed to improve the efficiency of nitrogen use on New Zealand's pastoral farms, was used to analyse the results from Owl Farm. Soils with higher levels of total nitrogen require lower rates of nitrogen fertiliser, while those with lower levels of total nitrogen can grow more pasture if higher rates of nitrogen fertiliser are applied. This can lead to overall production gains by either adjusting the amount of N applied to different blocks, or by adjusting timing to give most efficient returns and least loss to water table.

Pasture condition scoring in conjunction with PGGW seeds was completed for each paddock to track them over time and to identify the next crop and therefore pasture renewal paddocks.

Soil test results – comparison of this Autumn with the prior Autumn.

Soil testing results showed that lime applications have taken effect, with soil pH rising across blocks. The aim being for them to all be comfortably above pH 5.8 and closer to an average of 6.1.

Majority of the farm is now within ideal Olsen P levels. We had been using half rates of maintenance fertiliser until the target range is achieved, two blocks for specific reasons received none and have fallen below target ranges.

Potassium levels were above target range so limited application rates in the last year have drawn all blocks into the target range and so we will apply maintenance K moving forward.

With reduced maintenance Phosphate levels applied over the past two seasons, the companion application of Sulphur in maintenance fert was reduced. To offset this and ensure enough sulphur is present in the wet months, late autumn and spring Nitrogen applications have included significant amounts of sulphur.

In the coming season with an increase in maintenance fertiliser and therefore sulphur we are looking at reducing the total quantity of Sulphur in the autumn and applying varying rates to the blocks as required.

NOTES

Summary of nutrients applied 2018-2019

The table below shows the total nutrient applied per effective hectare in the last season and the summary of the plan for the coming season based on how soil tests have evolved.

It is important to note that this is the average application for the farm, but each block has a specific plan based on its requirements.

Nutrient	N	P	K	S
2017-18 Kg/ha	150	37	22	91
2018-19 Kg/ha	158	47	53	83

Nitrogen fertiliser use

In the past this has been done simply by calendar and consistent rate across the whole farm. We now use a suite of approaches to ensure best efficiency from the controlled amount of N fertiliser used.

We have a strong plan for the applications on the shoulders of the season e.g. calving time and autumn. We want to minimise the occurrence of surplus N application in this period that might drive up N losses to water table. We have completed Total N soil tests for the 7 blocks and so for some rounds in the season prioritise the blocks with the lower Total N levels via the N-Guru approach.

When we have N fertiliser planned, it is used by following the cows to ensure a strong growing wedge in behind the grazing round. Care is needed to ensure that this doesn't inadvertently reward the fastest growing paddocks, where slow growing paddocks get missed out. Quite a number of the applications are with products that contain other elements e.g. S and/or K to ensure no nutrient is limiting, and fertiliser application is most effective.



Implementation

Most products OWL farm spreads with their own spreader and effort has been made to calibrate this accurately. While this has been done very well for the commonly used products; for the less commonly used it has been difficult to initially calibrate then back calculate for verification/refinement. Proof of placement recording is the desire and there are advanced conversations on how we can get that set up.

On farm it is so easy to get busy and miss or mistime individual application of fertiliser (especially new grass or crop side dressings). We track these carefully to make sure they happen. Fertiliser application recording in reality is quite tricky. We work together on this and currently use a paddock by month matrix as you will see on the Focus Day. A simplified version of this with paddocks by month will be available as a small poster for people to take home on the day.

Ballance team

Ian Tarbotton	– Farm Management Committee
Mark Ter-Morshuizen	– Fertiliser representative
Sam McDougall	– Fertiliser representative from 18-19
Murray Lane	– Forage Specialist
Ian Power	– Overseer Expert
Mandy McPhail	– Marketing and Sponsorship

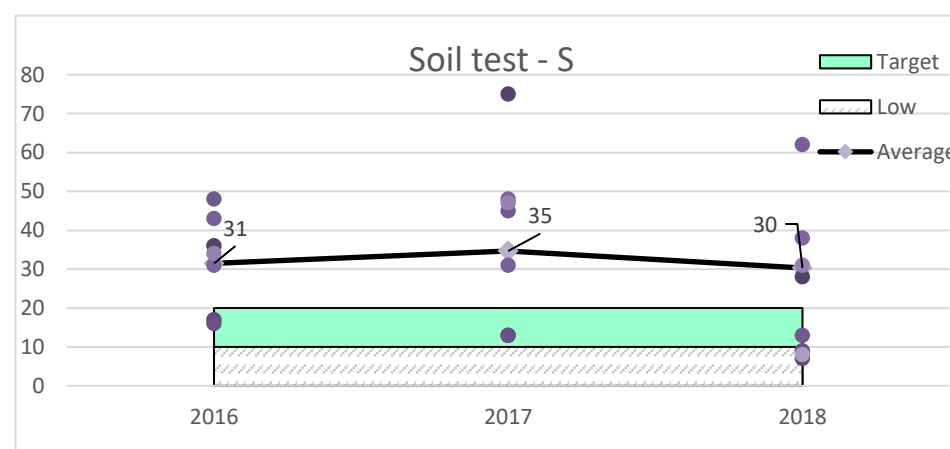
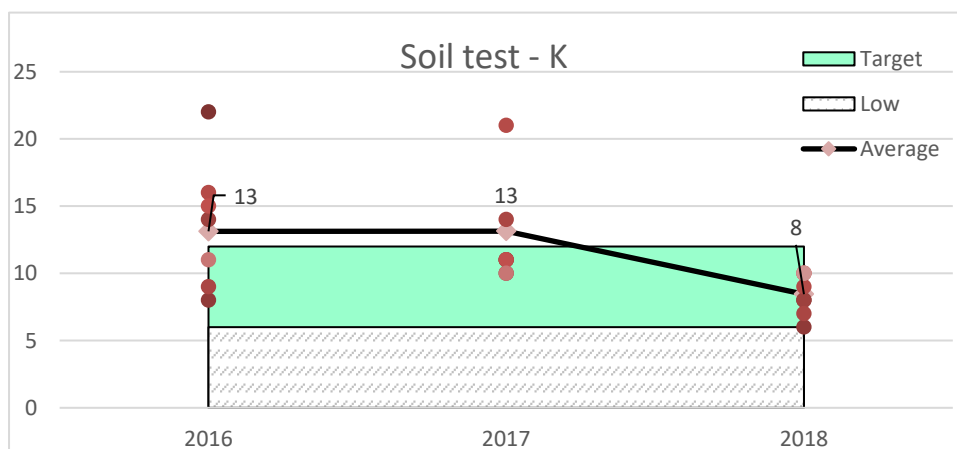
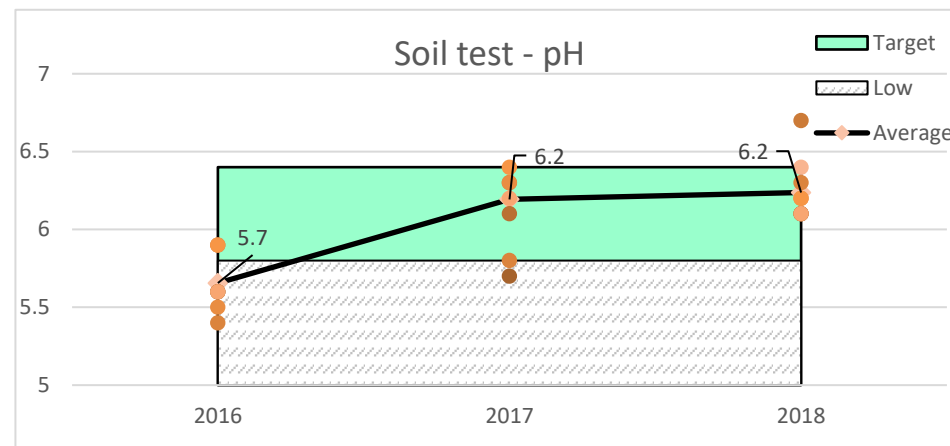
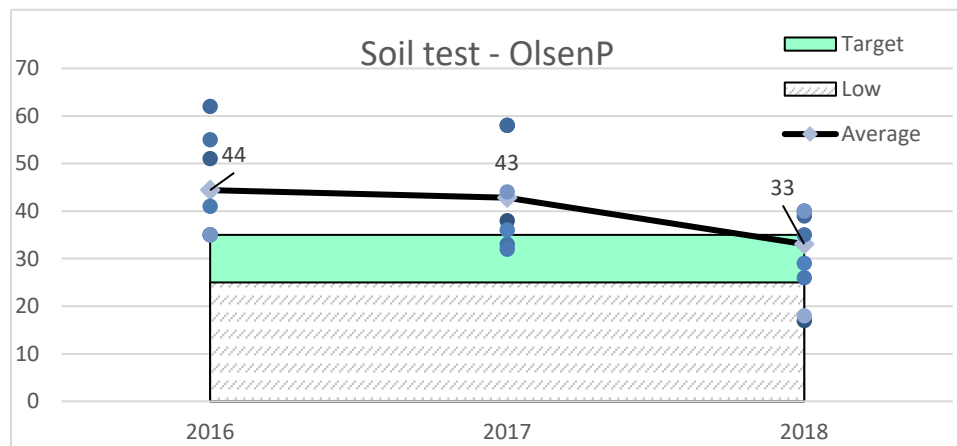


NOTES

SOIL TEST RESULTS

The graphs below show the change in soil tests over time. In each year the blocks are individually sampled and each dot in the column for the year represents the result for each block. Particularly with Olsen P and pH, the range has moved considerably and the average has moved into the target range.

The nature of Potassium and Sulphate as highly mobile nutrients means they are needing to be adequate topped up each year.



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PLANTAIN – A YEAR OF LESSONS

If the seed hits the soil – plants happen!

This year we have established plantain through 5 different methods:

- Sow with new grass (Spring) Very successful establishment
- Sow with new grass (Autumn) Variable success of establishment.
- Undersow into damaged pasture Successful, takes a few months
- Broadcast pre-grazing into sward Successful takes a few months
- Broadcast post-grazing into sward Successful, takes a few months

Below is preliminary data from a trial that DairyNZ have carried out regarding the plant population

Sowing method	Sowing Season	Plant population (spring)	Plant population (autumn)
Spray/drill	Spring	140	107
	Autumn	-	87
Broadcast before grazing	Spring	4	14
Broadcast after grazing	Spring	13	28
Undersown	Spring	20	26

Existing Sward

If you want to add plantain to an existing sward – we recommend broadcasting at 4kg/ha and you'll likely get the desired outcome.

We are still experimenting with how to get an even spread out of the bike spreader as our plantain distribution is currently uneven. We have very dense "rivers" of plantain and areas alongside with none that follow the bike path.

New grass

If you want to establish it WITH your new grass. We have found the following.

1. In spring it will establish incredibly well. Ours outperformed our grass and the paddocks became plantain dominant. Cool experiment, but not ideal as we expect moth burden will see thin paddocks within 12 months. Pics below show Spring population vs Autumn in same paddock!



NOTES

2. In Autumn, army worm ate a lot of our seedlings. An unusual season by all accounts, but a risky situation with expensive seed.
3. If you have weed burden in your paddocks, your post emergence spray options are incredibly limited.



4. Dynamo spray can be used, it's very expensive and has to be used in about a 1-week window when plantain is big enough and weeds are small enough.
5. 4kg/ha is a good rate to sow at.
6. Cows are quite happy eating it, but utilisation in the "solid plantain swards" was quite poor. Lots of flattened plants and pooped-on-leaf that kept growing next time.
7. It is low in Dry Matter. This is good for N loss, but controlling the quantity in the diet is important to maximise energy levels in the cows. In the "solid sward plantains" we grazed it like a crop at 33% of their daily feed when paddocks came up in the rotation.
8. Topping helps guarantee quality.



What will we do in future?

1. Keep adding it to our new grass.
2. Likely sow grass and clover in autumn and retain weed spray options.
3. Add plantain to new grass by broadcasting in the first spring.

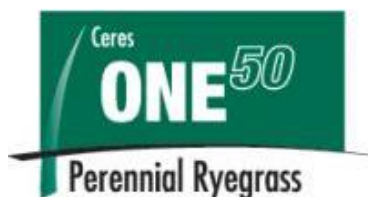
NOTES

REGRASSING 2017-18

Summary of New grass sown in 2017-18.

Regrassing reason	Area (ha)	Plan to do same 18-19?	Notes	Cultivars
Spring - Annuals--> New grass	6.6	No	Change from chicory to Turnips	Diploid ryegrass, Plantain & White Clover
Spring Patch up undersowing	12.0	No	Broadcast not undersow	Diploid ryegrass, Plantain
Grass to grass run-out pasture	8.1	Yes	Weak river terrace needs new species	Diploid ryegrass, Cocksfoot, Plantain & White Clover
Permanent pasture after crop	9.3	Yes		Ryegrass, Cocksfoot, Plantain & White Clover
Undersow weak pasture crop in 1 yr	6.4	Yes	Extend weak pastures before crop cycle.	Italian Ryegrass
Total Area regrassed	42.4		28% of Farm	
Plan for next year	23.8		16% of Farm	

What did we sow?



PGG Wrightson Seeds



NOTES

New Cocksfoot/Ryegrass/Plantain/Clover pasture 4 weeks after sowing - 26 March 2018



Same paddock having its second grazing by heifers – 7 May 2018



NOTES

Introducing the new technology in N control

Agriculture, and dairying in particular, has been identified as one of the key contributors to increased N in rural waterways. When you get down to it, there is primarily one aspect that has a major impact – and that is N from urine patches.

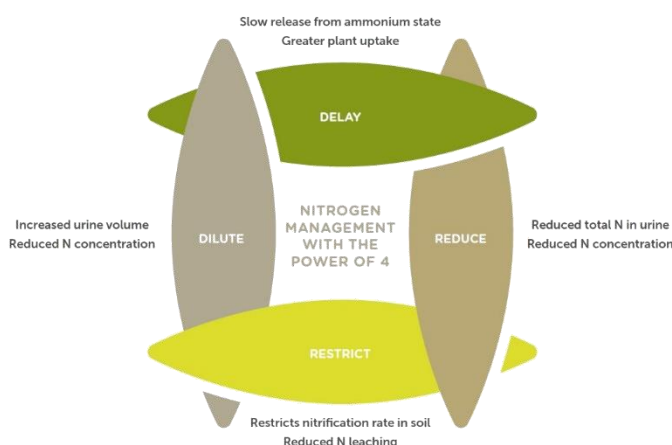
Accurate application of nitrogen fertiliser and responsible spreading of effluent assist in reducing the amount of N entering groundwater, but by far the majority of N leaching comes from the urine patch.

UP TO 90% OF THE N LEACHED TO GROUNDWATER ORIGINATES FROM THE URINE PATCH.

To date, controlling the N in the urine patch has been difficult and reducing the N fertiliser application rate has been seen as the most practical solution.

HOW IT WORKS

Ecotain® combines not one, but four modes of action that work together to significantly reduce N leaching from the urine patch.



DILUTE

Ecotain environmental plantain increases the volume of urine animals produce, which means the N being excreted is in a more dilute form, resulting in a reduced N load in the urine patch.

REDUCE

Ecotain reduces the amount of dietary N which is excreted in urine, compared with ryegrass. This reduces the amount of N released into the soil via the urine patch.

DELAY

In urine patches from animals grazing Ecotain, the conversion from ammonium to nitrate is delayed. Slower conversion allows plants a greater opportunity to uptake N, significantly reducing the potential for leaching.

RESTRICT

The presence of Ecotain plants in the soil reduces nitrification, likely through the effect of a biological nitrification inhibitor.

Agronomics

Research has demonstrated that not all plantains (current cultivars or breeding lines) are capable of reducing nitrate leaching from the urine patch through the four mechanisms Ecotain can – dilute, reduce, delay and restrict. In all other agronomic aspects as well as environmental, Ecotain is an excellent example of a high quality, productive, forage plantain.

- Suitable as a 2-3 year crop option.
- Positive impact on milk production when grass quality drops in summer.
- Also ideal for undersowing or broadcasting on to damaged pasture.
- Can be grazed to deliver 100% of the diet.

DRYMATTER PERFORMANCE

- Very similar DM quantity and quality to ryegrass pasture.
- Can add value in terms of both drymatter and quality to any farming system.
- Contributes invaluable DM production, typically at times of the year when ryegrass and other species, e.g. white clover, are not performing.

IMPLEMENTATION

NEW PASTURE - Include 4 – 6 kg of Ecotain into your perennial pasture mix when renovating paddocks

UNDERSOW - Direct drill 4 – 8 kg of Ecotain into damaged or open pasture

BROADCAST - Broadcast 4 – 8 kg Ecotain into damaged or open pasture

OWL FARM WEEKLY MONITOR WALK

As we move forward into a new season with a much-diminished arsenal of supplements and a strong desire to increase our pasture harvested and pasture quality – the focus on pasture management is as important as it has ever been. This means that we need to ensure we validate our own maths by focussing on what our residuals are, as the cows very good at telling us whether we got the pre-grazing cover right.

We are starting a weekly monitor walk of the top block of the farm – approximately 80 ha that will be completed at 11am every Tuesday.

We hope that this regular platemetering will keep us fit and focussed, along with giving a second validation of pre-grazing and post grazing covers to ensure we maximise out pasture grown and eaten.

These walks are open to the farming community, so individuals, groups, visitors and students can share the experience with us and enjoy some robust discussion as we work to ensure we get the best estimate of what the cows are being fed.

The other outcome of these walks is hopefully a further opportunity to engage with other farmers for advice and support in both directions!

So feel free to drop by and bring your own platemeter, probe, or eye-ometer to the Demonstration office, leaving at 11am Tuesdays!



St Peter's School/Lincoln University
Demonstration Dairy Farm

Owl Farm - Weekly Monitor Walk

Tuesdays, 11am - 12pm

Providing knowledge - Home Grown Feed



Weekly 1 hour farm walk, departing from the Owl Farm office

- Monitor pasture covers on Owl Farm's top block
 - Focus on home grown feed
- Bring your own measuring method to compare

All Welcome!

Owl Farm, St Peter's School, SH1, Cambridge

For further information email: theresa@owlfarm.nz or phone: 07 827 9738

www.owlfarm.nz



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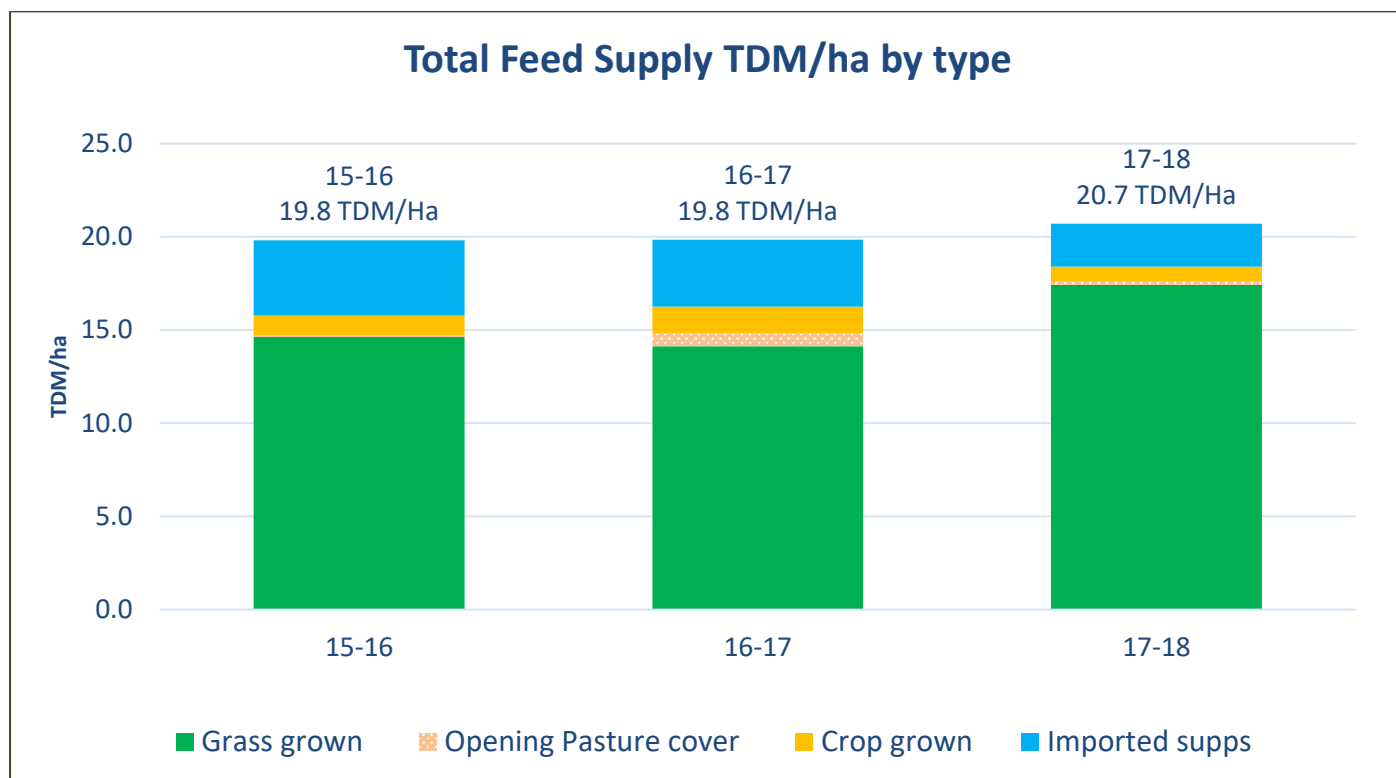
SUMMARY DATA

FEED INFORMATION

In short, we've grown more grass so far this year, and we've also eaten more of what we've grown which is pleasing! Although, Pasture eaten to date is a little bit complex.

Pasture growth this year, has definitely occurred in greater quantities than last year for a variety of reasons. To date pastures have grown an average of 17.2TDM/ha compared to only 14T grown last year. An increase of 23% over last year.

Imported Supplements fed out (whether grown prior years or imported to the farm) have supplied 2.3TDM/ha this year and 3.4T DM/ha last year. A reduction in bought in feed use of 32%



So far, we've had a total increase in feed supply for the year of 0.9TDM/ha. Not all of this was good-quality for milk conversion or harvested (we did a big chunk of topping over summer), but we do have an extra 54T of Grass silage still on hand (0.4TDM/ha) to help us through until next October.

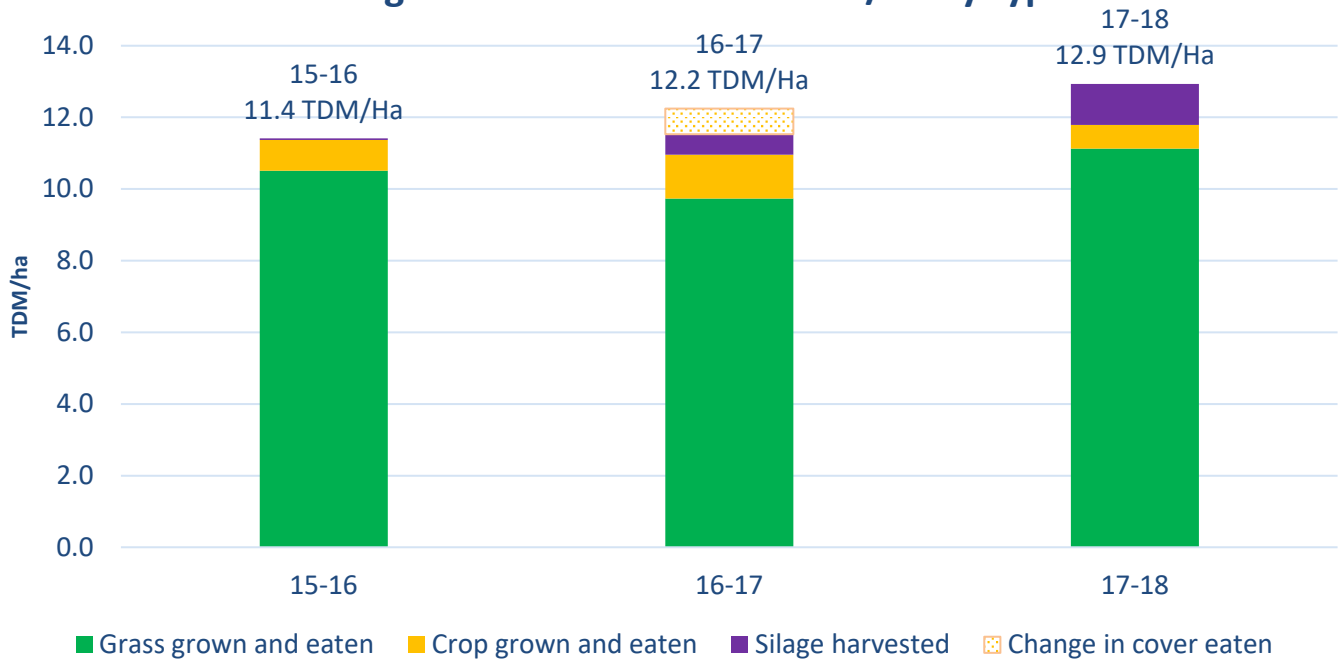
This year we have eaten 11.1TDM/ha of the 17.1TDM grown. This time last year, we had eaten 9.6TDM/ha of the 14T grown. Ultimately this is an increase in pasture eaten of 14.6% of the grass grown this season.

This year 1.1T/ha DM has also been harvested in silage, compared with 0.7TDM/ha harvested last year. Crop harvest adds 0.8TDM/ha this year compared to 1.3TDM/ha last year. This brings the total harvested of homegrown feed GROWN this year to 13.0TDM/ha versus last year of 11.6TDM/ha. An Increase of 12%.

Additionally there is 0.8TDM of the winter pasture cover eaten in the year last year compared to 0TDM this year. So the total of homegrown feed eaten this year is 13.1TDM vs 12.2TDM last year. An increase of 7%.

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Home grown feed harvested TDM/ha by type

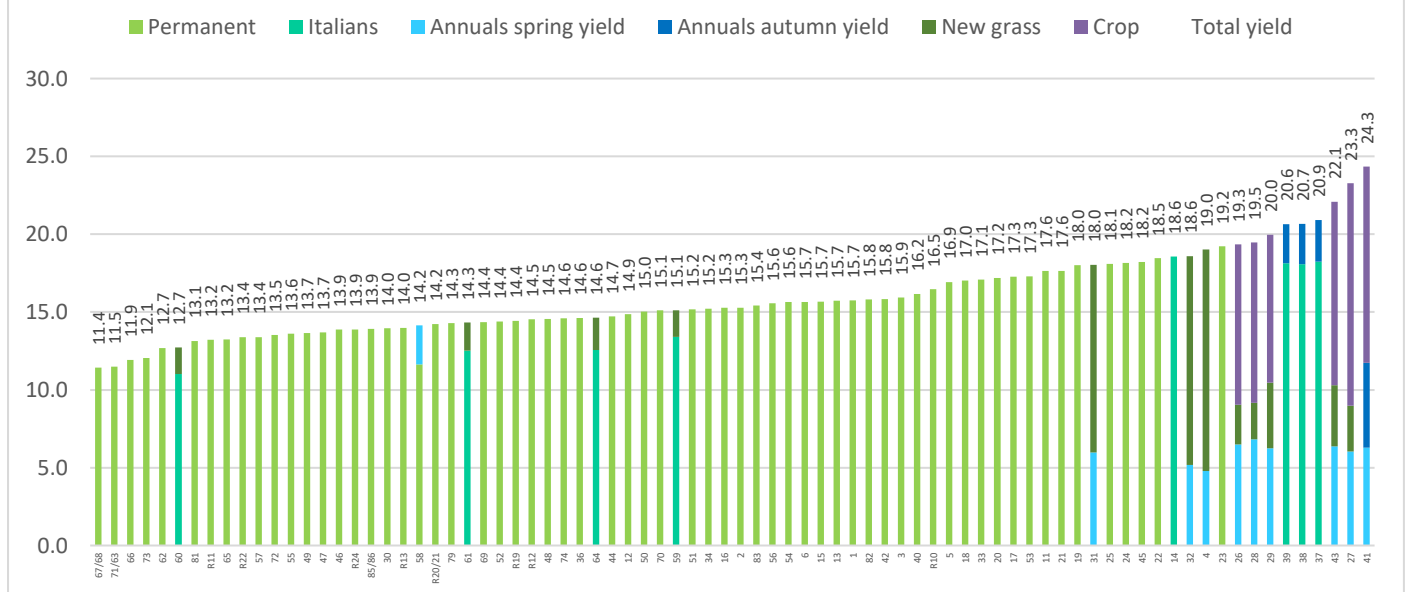


In paddocks that were in Annuals from 1 June, to date the range of pasture grown by paddock is quite varied with Annuals having grown 6.0TDM/ha in spring, plus 12.1TDM if into spring new grass, or 11.5TDM in crop then into Autumn new grass or annuals giving a yield to date between 18-124.3TDM/ha.

Solid sward Italians averaged 15.3TDM/ha so far plus autumn new grass and annuals adding yield of 2.2T DM/ha giving a paddock average yield of 17.2TDM/ha.

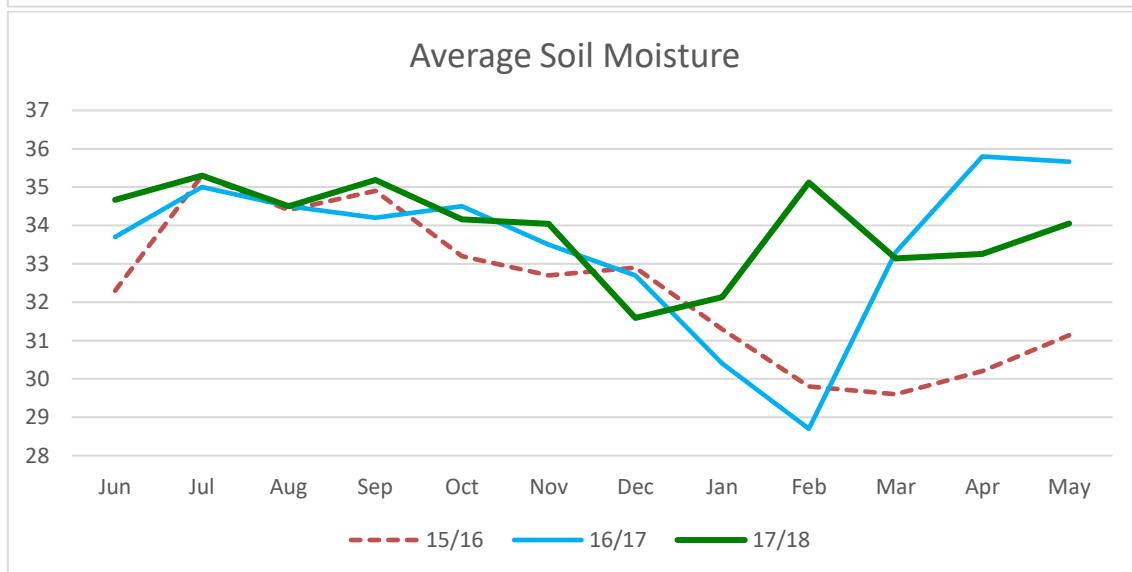
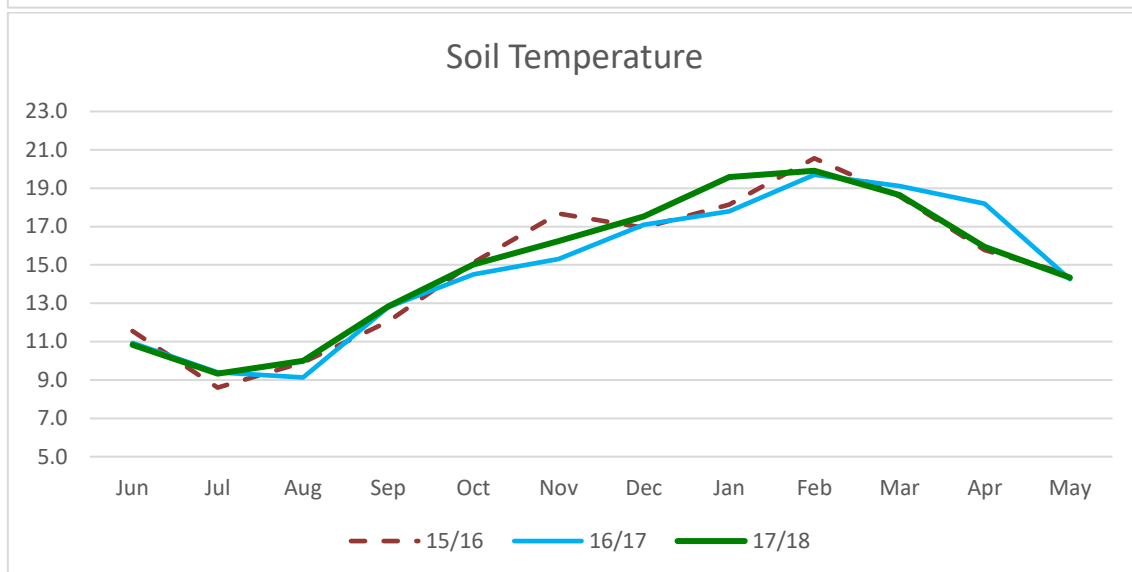
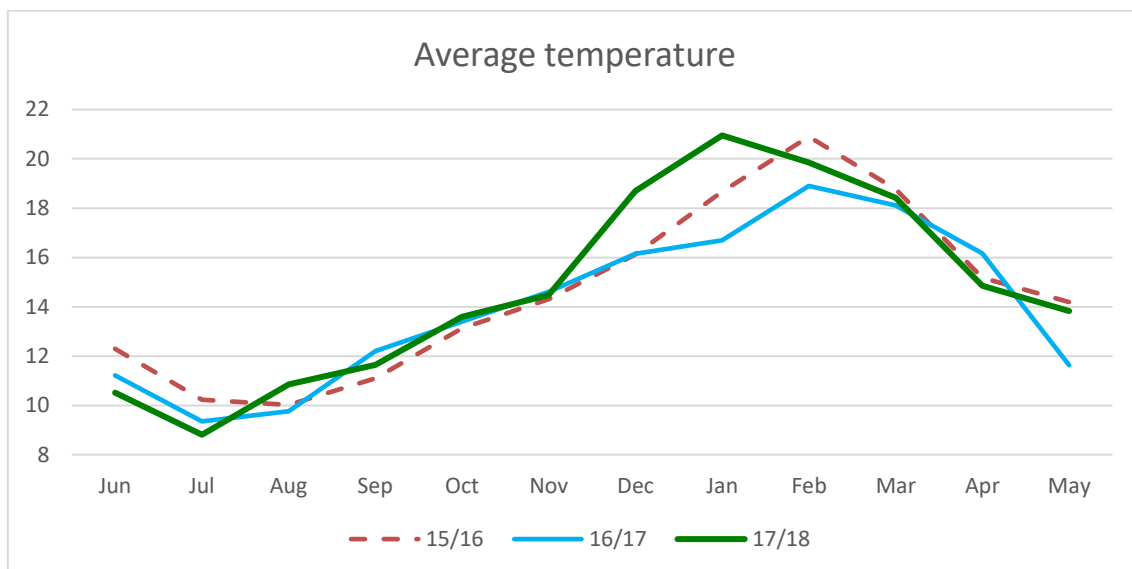
Paddocks in permanent pasture all year have yielded an average of 11.4TDM/ha ranging from 10.4 – 19.2TDM/ha.

KgDM/ha grown to date



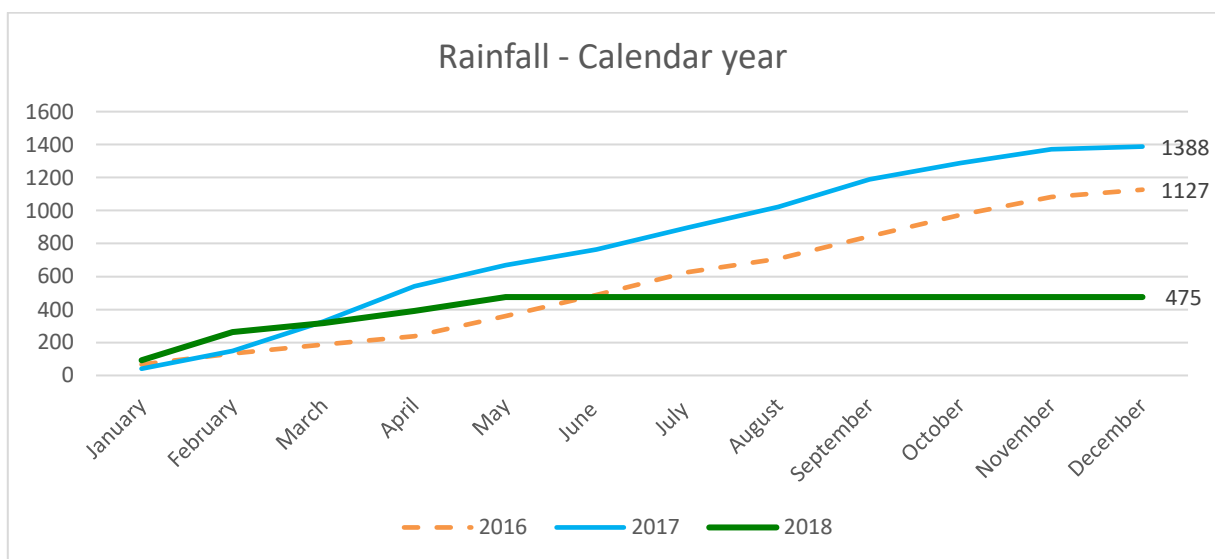
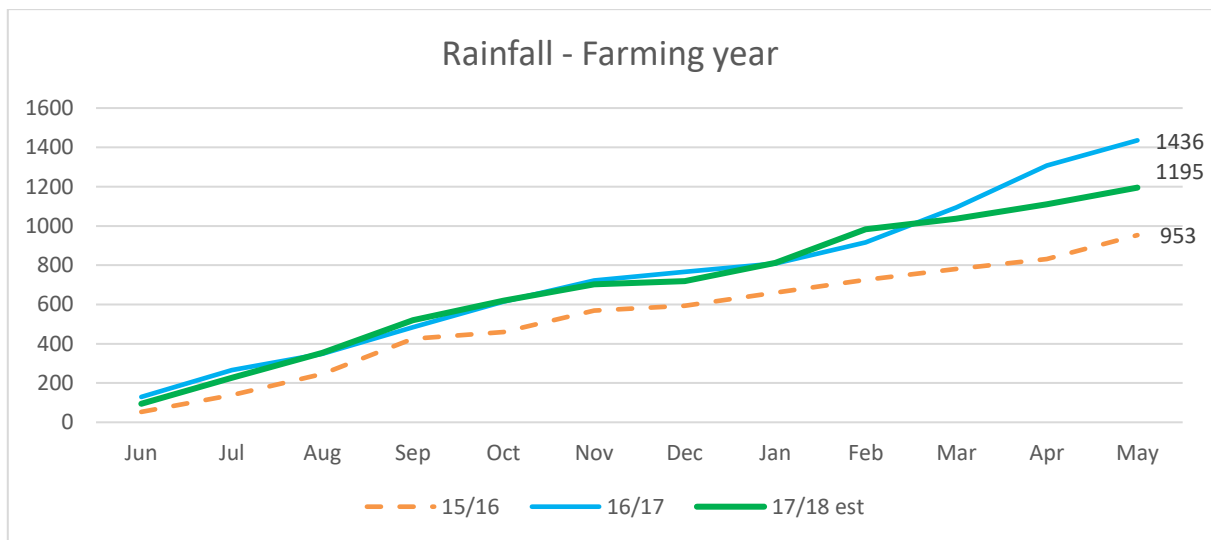
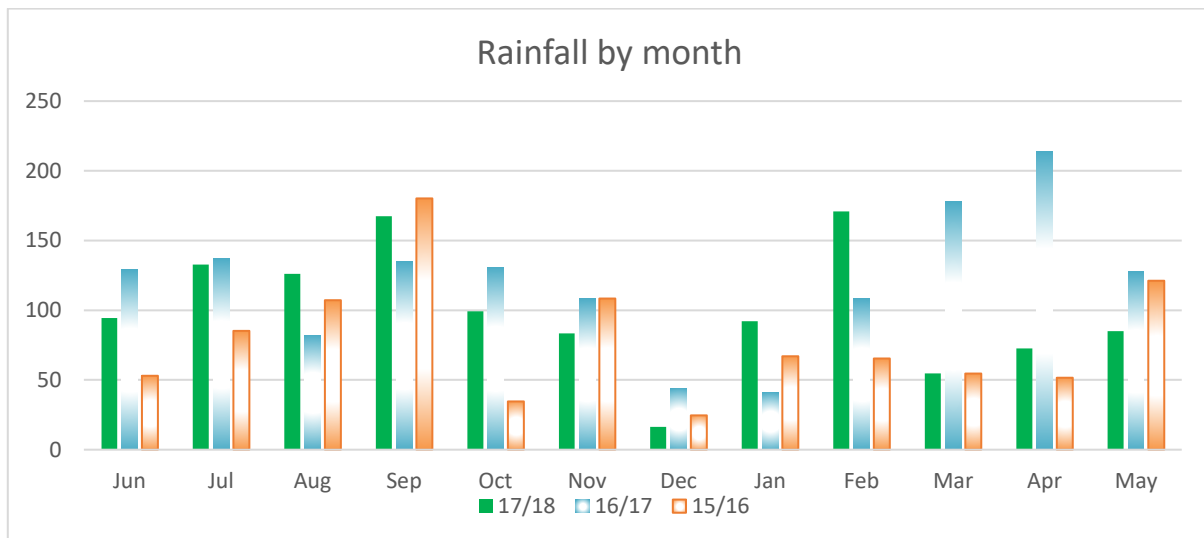
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CLIMATE



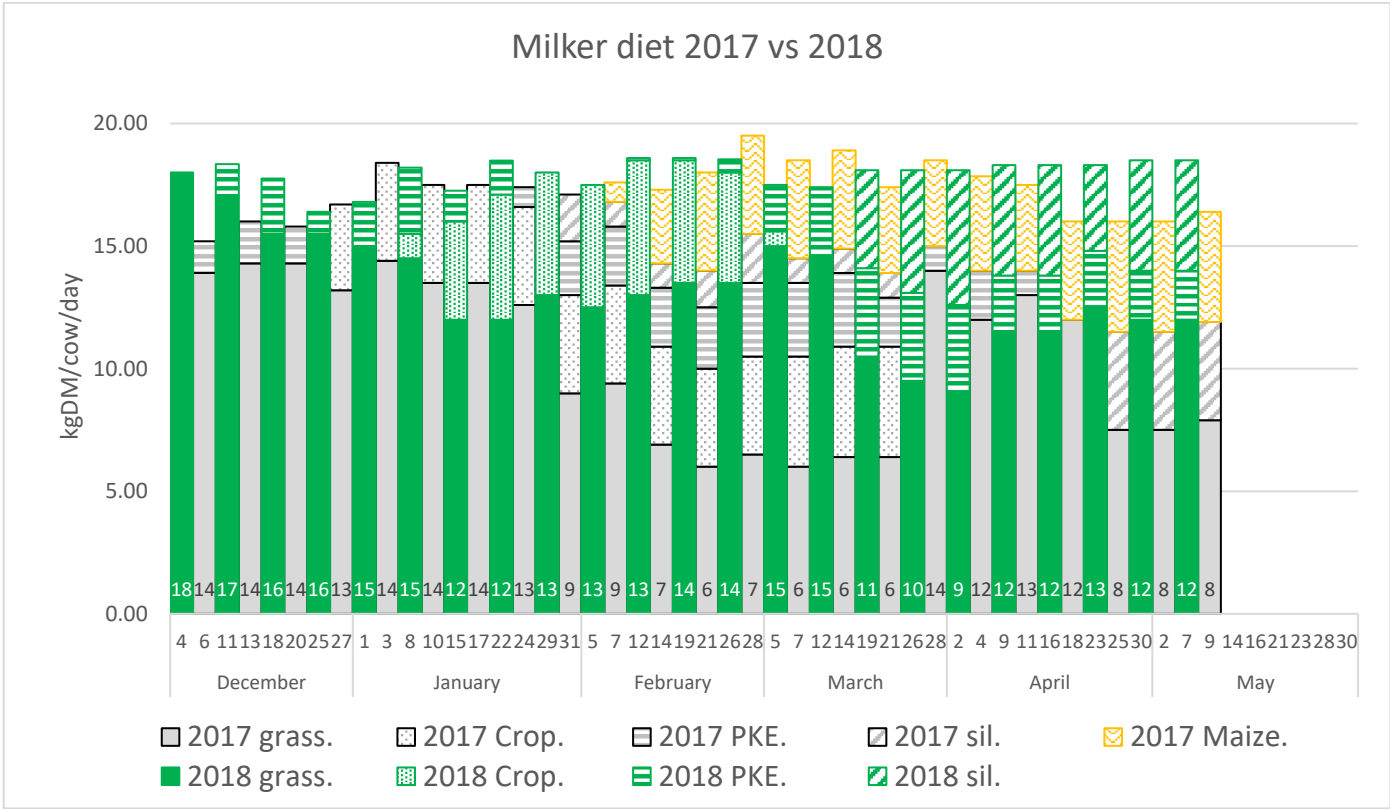
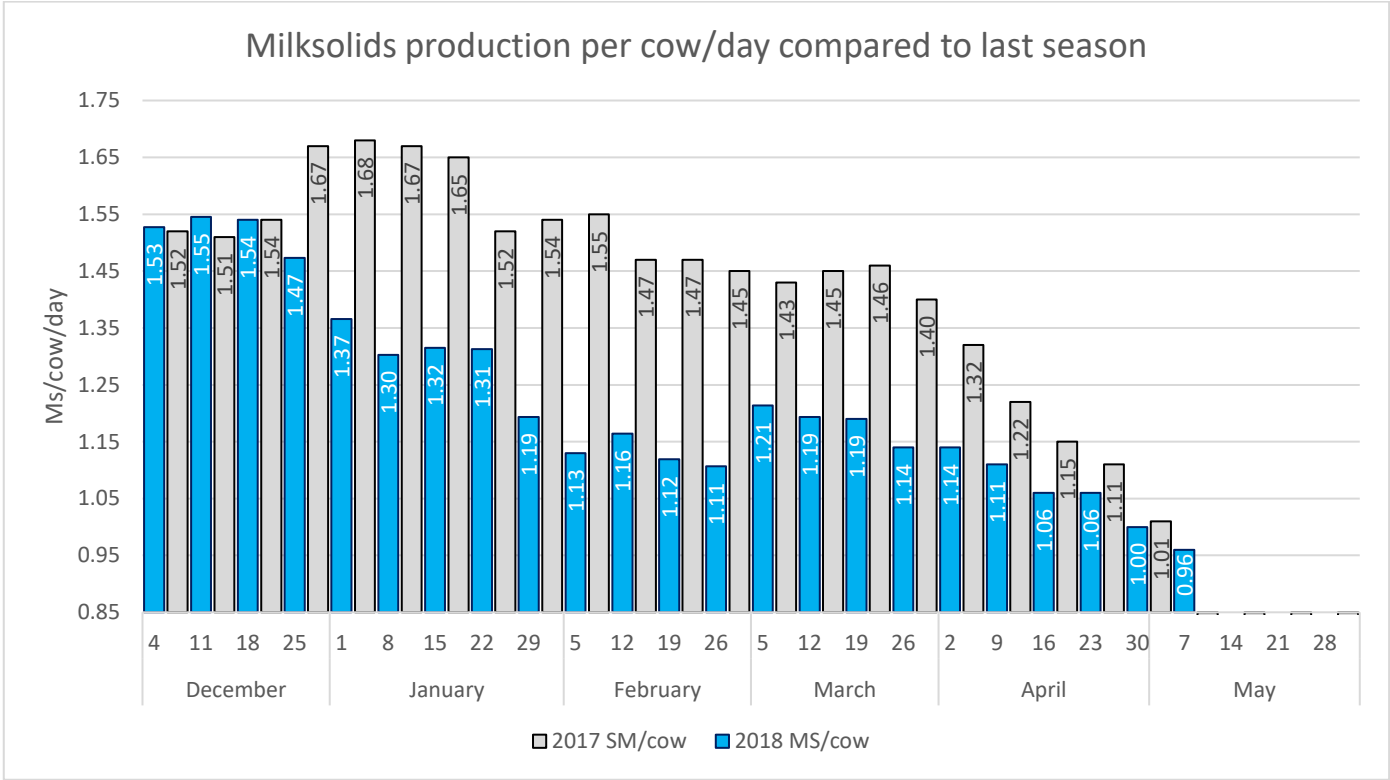
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RAINFALL



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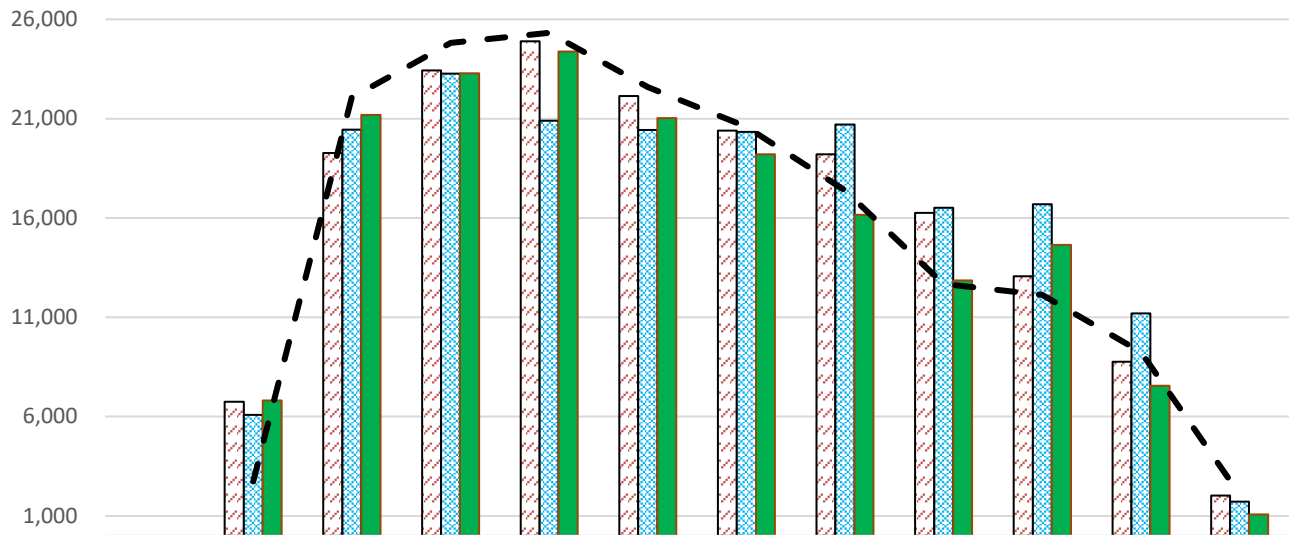
PRODUCTION



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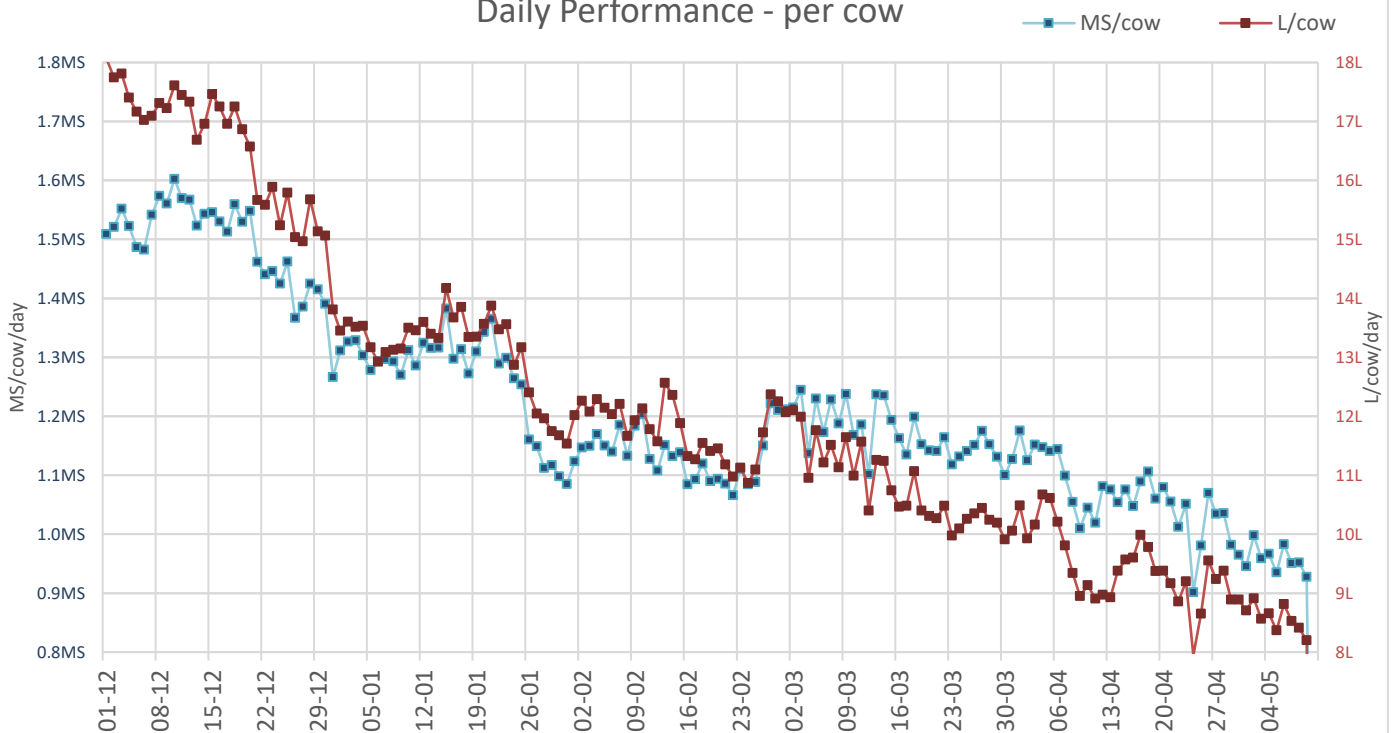
Production: Monthly Performance



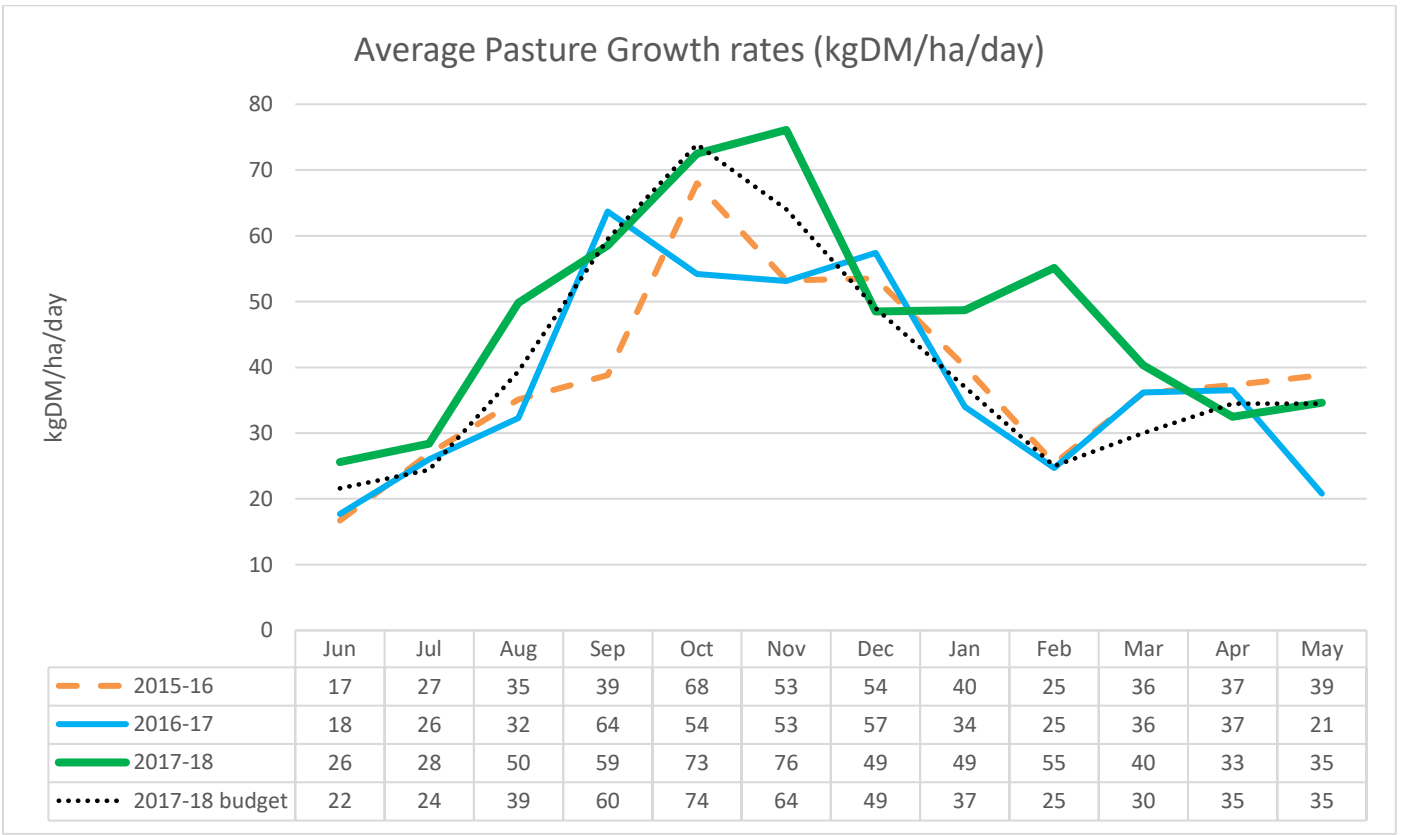
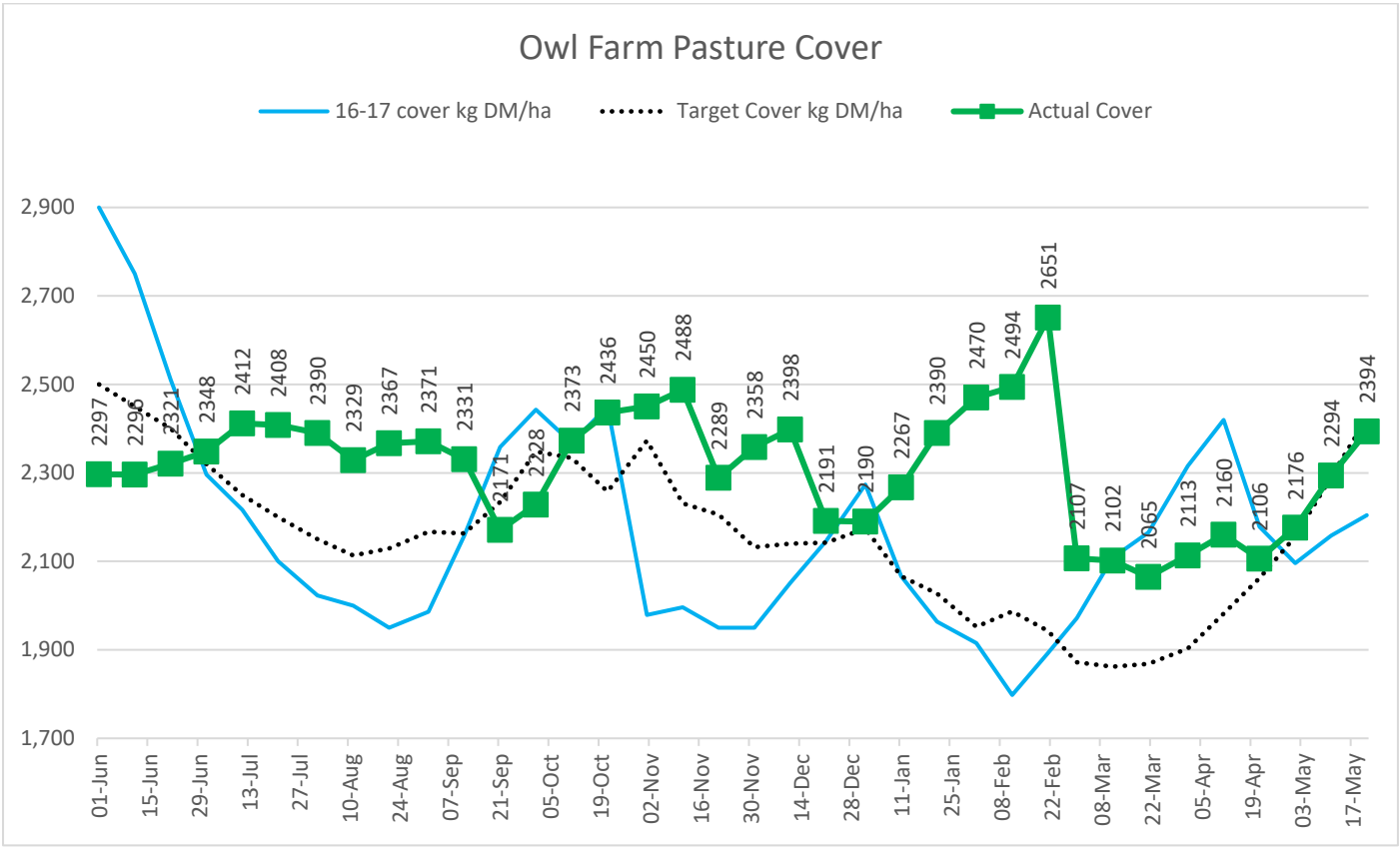
	June	July	August	September	October	November	December	January	February	March	April	May
15/16 production		6,756	19,277	23,422	24,899	22,137	20,397	19,201	16,258	13,066	8,766	2,019
16/17 production		6,095	20,440	23,267	20,896	20,431	20,337	20,697	16,519	16,693	11,202	1,717
17/18 production		6,807	21,183	23,287	24,376	21,030	19,213	16,158	12,856	14,641	7,549	1,070
Budgeted 17/18		2,732	22,055	24,806	25,322	22,589	20,598	17,378	12,675	12,133	9,250	2,087

15/16 production 16/17 production 17/18 production Budgeted 17/18

Daily Performance - per cow

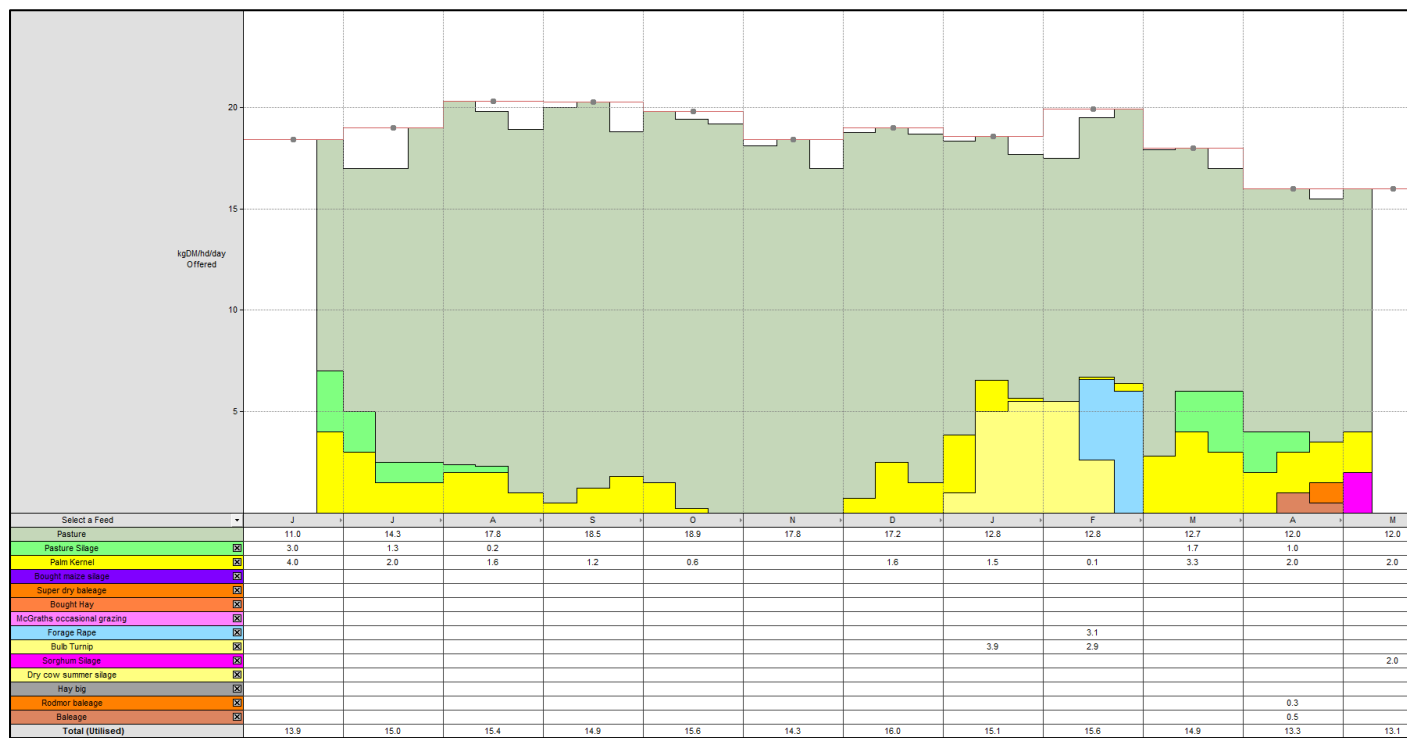


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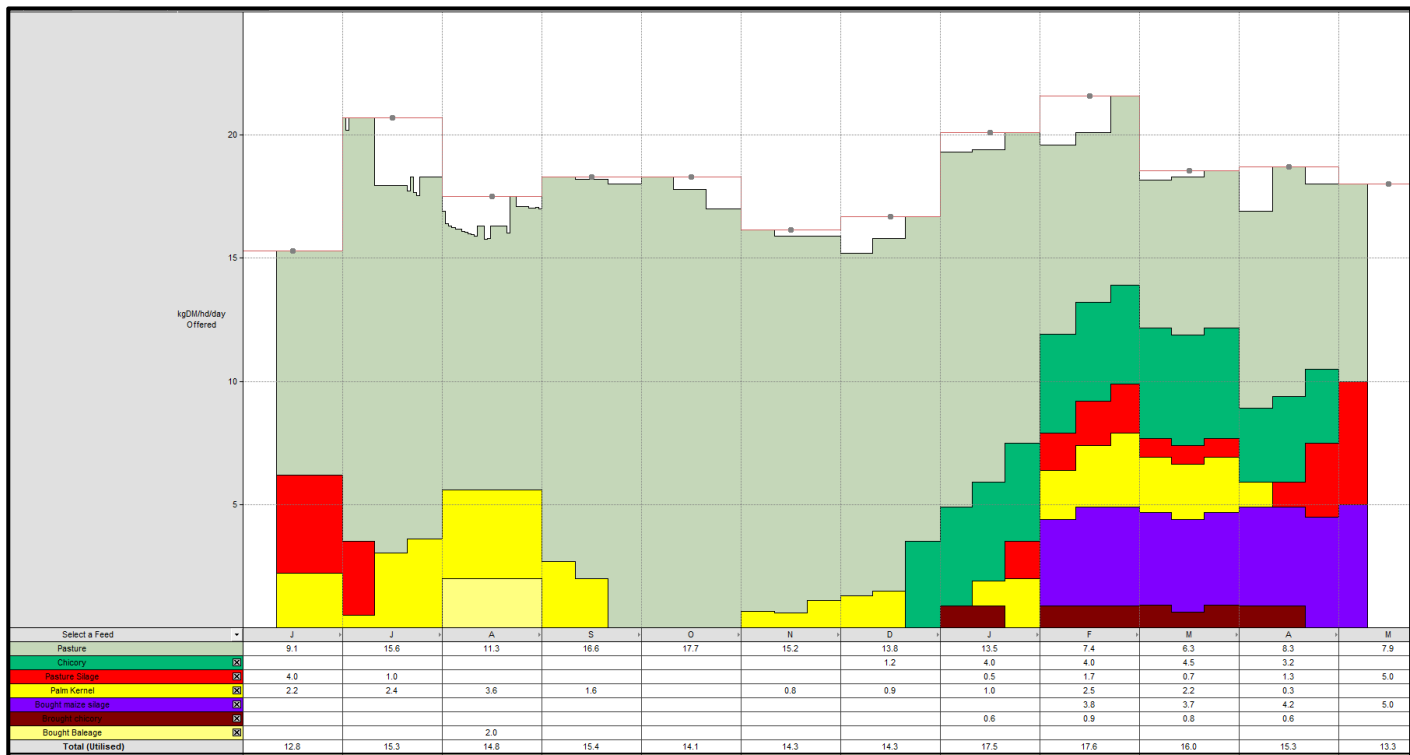


SEASONAL FEED BUDGET

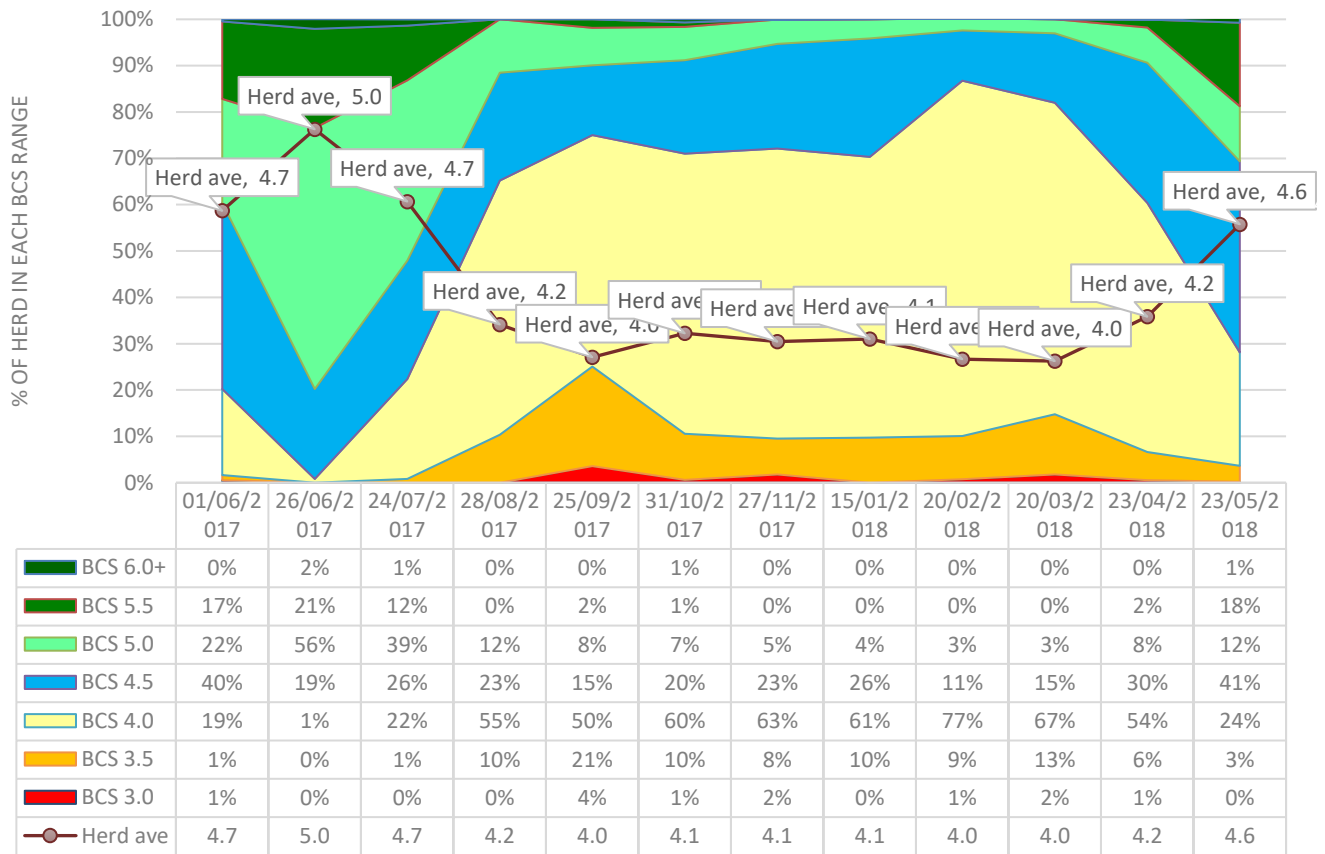
Supplementary feed use to date and forecast throughout the 2017-2018 season



Supplementary feed use throughout the 2016-2017 season



BCS distribution of herd 2017-2018





Next Farm Focus Day
Wednesday 19 September, 2018

Weekly Monitor Walk
Tuesdays, 11am



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