



**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, 22 November 2017

## PROVIDING KNOWLEDGE

**Owl Farm Season Update:** Protecting Spring Production

**Financial Review:** How does the cashflow look so far?

**Healthy Rivers Plan Change** - Understand how to get your Farm Environment Plan

**Summer Strategy** – Summer feed and management plan.





## 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.**

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## Emergency Contact Information

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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

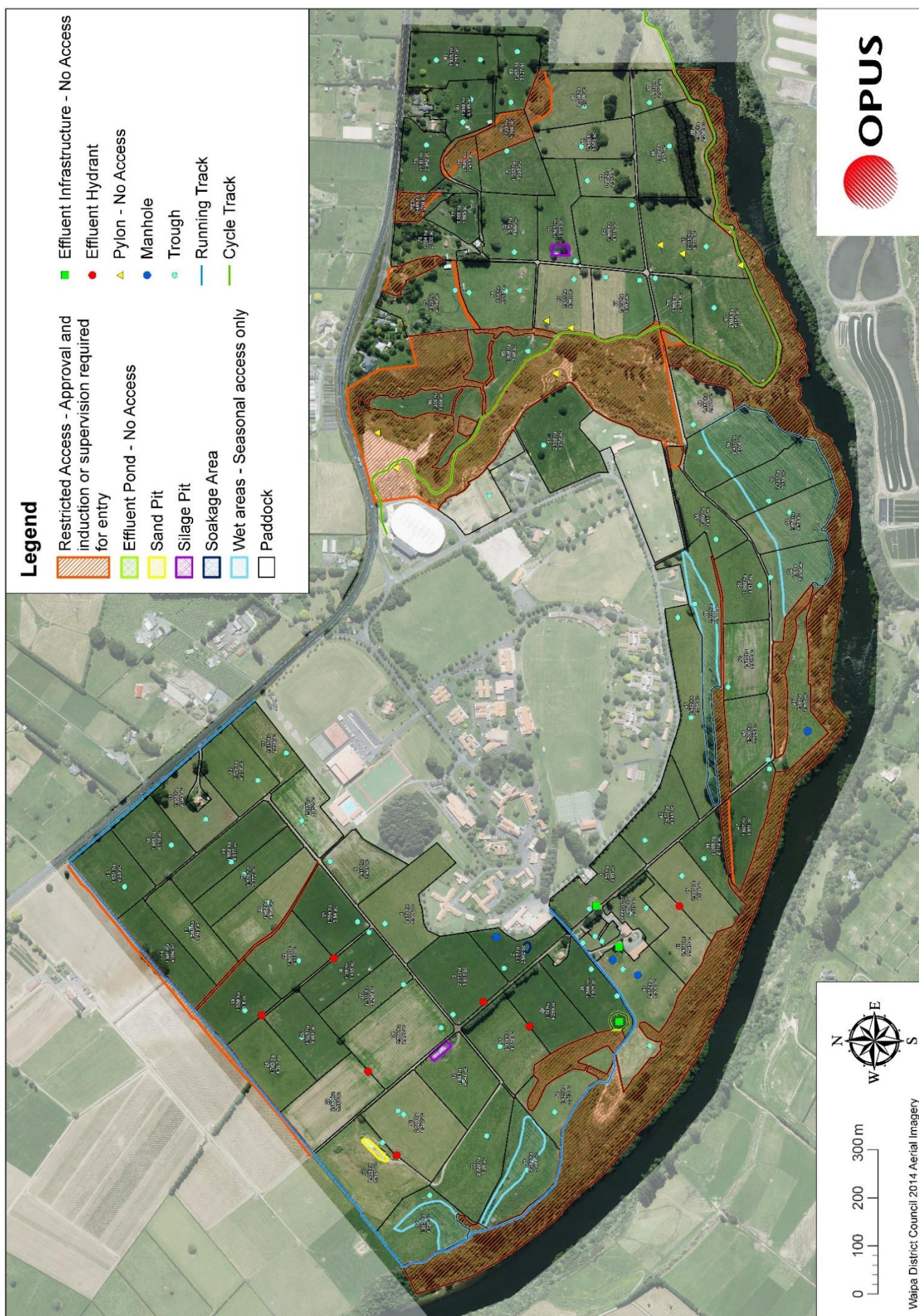
- |   |              |
|---|--------------|
| • Louise Cook – Demonstration Manager         | 027 808 5777 |
| • Tom Buckley – Farm Manager                  | 021 058 4916 |
| • Sheryl Watkins – Demonstration Co-ordinator | 021 039 3703 |

### 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	441
	Peak Cows (1Dec)	445	423	420
	Peak Stocking Rate Cows/ha	2.95	2.90	2.84
Production	Total kgMS	176,197	178,294	171,135
	MS/cow	396	421	407
	MS/ha	1,167	1,221	1,156
	MS/ha from homegrown feed	949	1,011	1,072
Feed and Inputs	Feed Grown TDM/ha	13.9	14.2	14.7
	Feed Harvested TDM/Ha (actual kgs)	11.9	12.5	13.1
	Feed harvested TDM/ha (@11.0MJME/kgDM)	12.4	12.8	14.4
	Supplements Imported TDM/Ha	4.2	3.1	2.0
Financials	Nitrogen Applied/effective ha	149kg	163kg	150kg
	FWE/kgMS	\$4.97	\$4.07	\$4.06
	OPEX/kgMS (incl deprn & feed inventory adj)	\$4.91	\$4.75	\$4.37
	EFS/ha actual payout (\$3.90/\$6.15/\$6.50)	-\$144	\$2,742	\$3,423
	EFS/ha @ \$5.80 farmgate milk price	\$2,101	\$2,287	\$2,632
	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%	51Ha 34%
	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.			

## SEASON TO DATE

	Year to date 13/11/17	2015-2016	2016-2017	2017-18	Notes
Stock	Milking Platform	160	146	148	
	Cows on farm	457	423	419	
	Peak cows	445	423	419	
	Cows in vat	453	416	416	
	Stocking rate on farm	2.86	2.90	2.83	
Production	Total kgMS Season to date	85,068	80,409	85,788	1
	MS/cow/day - last 10 days	1.68	1.66	1.75	2
	MS/ha/day - last 10 days	4.77	4.74	4.88	
	MS/cow Season to date	191	190	205	
	MS/ha Season to date	532	551	580	
	MS/ha from homegrown feed to date	393	464	481	3
Feed and Inputs	Pasture cover 13 November	2112	1950	2250	4
	Pasture cover 1 June	2142	2951	2256	
	Pasture cover min before Balance Date	1897	1950	2331	
	Reduction in cover TDM/ha (1 jun to BD)	0.3	1.0	0.0	5
	Pasture grown TDM/ha	6.3	6.7	7.9	6
	Total pasture supply TDM/ha	6.6	7.7	7.9	
	Supplements fed/ha	1.9	1.2	1.3	
	Total Feed supply TDM/ha	8.5	8.9	9.1	
	Homegrown feed eaten TDM/Ha (grown this year)	5.0	4.9	5.5	7
	Homegrown feed Harvested TDM/ha	5.3	6.4	5.9	8
	Imported Supplements Fed TDM/ha	1.9	1.1	1.2	
	Homegrown supplements fed TDM/ha	0.0	0.1	0.1	
	Silage on hand TDM 13 November	8	108	96	9
	Silage harvested TDM Season to date	8	108	53	
	Nitrogen Applied/effective ha	91kg	104kg	91kg	10

NOTES

# Owl Farm Numbers – Seasonal Update

## “Back on Track”

### Increased production season to date

1. To date we are just over 5,000kgMS (7%) ahead for the season, and still ahead on a daily basis.
2. Performance/cow is tracking above the last two years daily and season to date we are 15 kgMS/cow (8%) ahead. This is a result of a slight improvement in cow condition at calving, and ability to provide more consistent feed quantity and quality this year.

Critical focus on feed planning is the biggest change this year from last. With another year of knowledge on how the farm is likely to grow, an aggressive approach to surplus control has maintained a feed wedge in front of the cows of high quality pasture. Tactical assessment daily on residuals and production have been used to adjust allocations for best performance. It has NOT always been perfect, but fail fast and learn fast is the motto of the year.

### More milk from homegrown feed

3. The conversion of homegrown feed (in whatever form) into milk so far this year has seen the amount of milk from homegrown feed vary. As a proportion 1% less milk this year is from homegrown feed (82% vs 83% last year). However, with an increase in total milk produced, we have produced more milk in total/ha from homegrown feed. Note: excluding the feed described in point 5 below, there is effectively a 1% gain over last year.

### Feed first – farmers grow feed for cows, cows make milk

4. Pasture cover on hand at present is considerably higher than this time last year. In part this is because another small surplus is on hand and excluded for silage, and also because less silage has been cut year to date.

This extra cover on hand YTD represents 0.3TDM/ha grown but as yet un-harvested.

5. Between 1 June and Balance date last year, cover dropped from 2951kgDM/ha to 1950kgDM/ha as this feed was eaten by the herd. This year cover started low and didn't drop, largely because of the extra supplement put in to lift cover from the sub-target start point.

This drop in cover last year, represents a store of feed that was on hand, that was homegrown (albeit the previous financial year in May) and was eaten by the cows last year. This does make it a complication when considering pasture eaten between the two years.

6. The total pasture grown so far this year is considerably higher than in the last 2 years, in the order of approximately 17% more grass grown year to date. This is in itself a fantastic statistic and reinforces the faith in both the regressing regime and focus on improving our pasture management.
7. When you itemise out the entire feed supply and work backwards to how much feed eaten comes from each source, we can see that the amount eaten this year of the grass grown this year shows a lift over the previous seasons by 0.6TDM/ha. This is despite the poor utilisation experienced in a very wet start to the year.
8. When we look at total home grown feed harvested YTD however, we have harvested less this season by 0.5TDM/ha. This is in large part due to the feed bank effect of the cover on hand at 1 June, plus the fact that the silage was cut earlier last year.

The increased pasture cover on hand as of 13 November represents about 0.3TDM/ha on-hand to harvest of that difference between years, so we are unfazed by the apparent decrease in yield so far.

9. Similar levels of homemade silage are on hand between the two years, despite having made less already this year. This is because with the excellent growth this spring, 40TDM of silage was retained in the stack, and provides a headstart on the summer feed supply.

### Nitrogen year to date

10. The favourable growth we have had this season has seen us stick to our Fertiliser Plan and only use 91kgN/ha this year, 13 less than the same time last year.

This has largely been in the form of little and often, with application rates (excl crops) of 25kgN/ha. In June the last of the farm received a PhasedN application (10% of the farm).

July/August saw Ballance Ammo36N applied, August/September a Ballance Ammon 30N and in September/October a move to Ballance Sustain Green around the farm.

Most paddocks have also had their annual application of Potassium, Lime and Phosphate.

NOTES



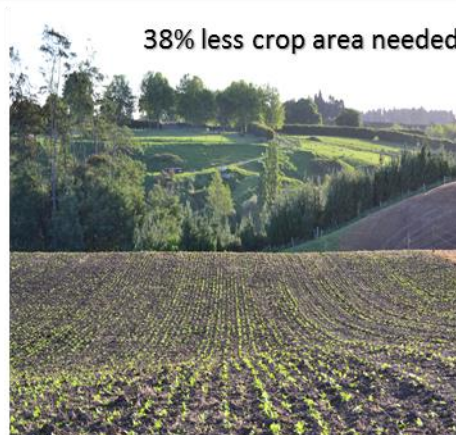
85,788 kgMS    +7%  
 205 kgMS/cow    +7%  
 580 kgMS/ha    +5%



7.9 TDM pasture grown/ha    +17%  
 5.9 TDM feed harvested/ha    - 8%  
 91 kg Nitrogen/ha    -13%



38% less crop area needed



## Success

- 17% more grass grown
- 14% inc "grown grass" eaten
  - 6% lower SCC
- 2% increase in 3 week SR
- 100% lift in safety meetings
- Biosecurity plan underway
- 13% less Nitrogen YTD

## Challenge

- 51% less silage harvested YTD
- 8% less total grass eaten
- September weather:
  - 36 more lame cows
- 25T unplanned PKE used
  - 0.2 gain in BCS lost

## Result

- 7% more milk
- \$13k reduction costs
- \$0.44/kgMS lower FWE
- More safety awareness
- All visitors now footbath
  - 0% Increase in NRR
- 0% drop in Animal Health

NOTES



# HOME GROWN FEED SUMMARY

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 7.9TDM/ha compared to only 6.7T grown last year.

In addition to pasture grown, last year the farm started with a feed bank in the way of Pasture cover on hand at 2,951kgDM/ha which quickly erode down to 1,950kgDM/ha. Whilst grown in the previous final year in May, it was eaten in the 2016-17 financial year and does contribute to homegrown feed harvested.

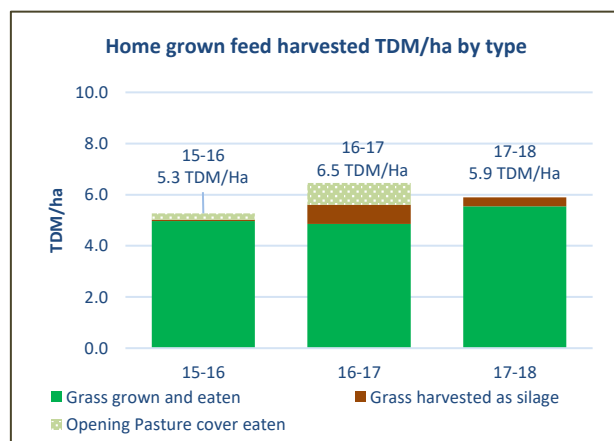
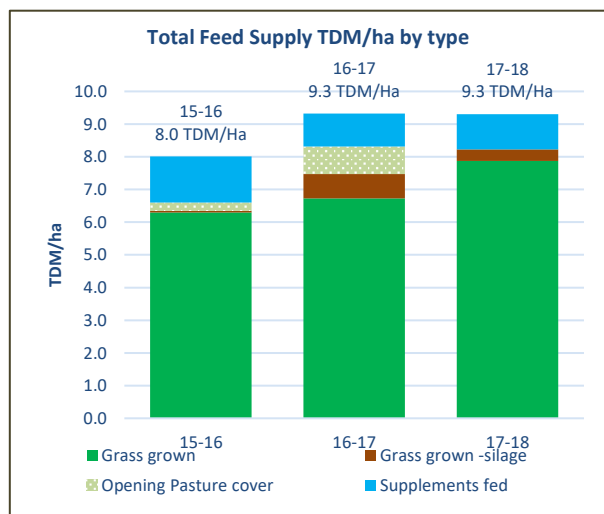
This year the change in Cover from 1 June to Balance date this year was a drop of only 0.1TDM/ha, where last year this supplied a total of 1.0 TDM/ha. Supplements fed out (whether homegrown in prior years or imported) have supplied 1.3TDM/ha this year and 1.2T DM/ha last year.

This means our total feed supply this year is identical to last year at mid-November 9.3TDM/ha. However, we have an extra 5,000kgMS produced (\$33,000 revenue), 50T less silage harvested (\$15,000 less inventory of feed) and 41T more pasture cover on hand!

This year we have eaten 5.5TDM/ha of the 7.9TDM grown. This time last year, we had eaten 4.8TDM/ha of the 6.7T grown. Ultimately this is an increase in pasture eaten of 14% of the grass grown this season.

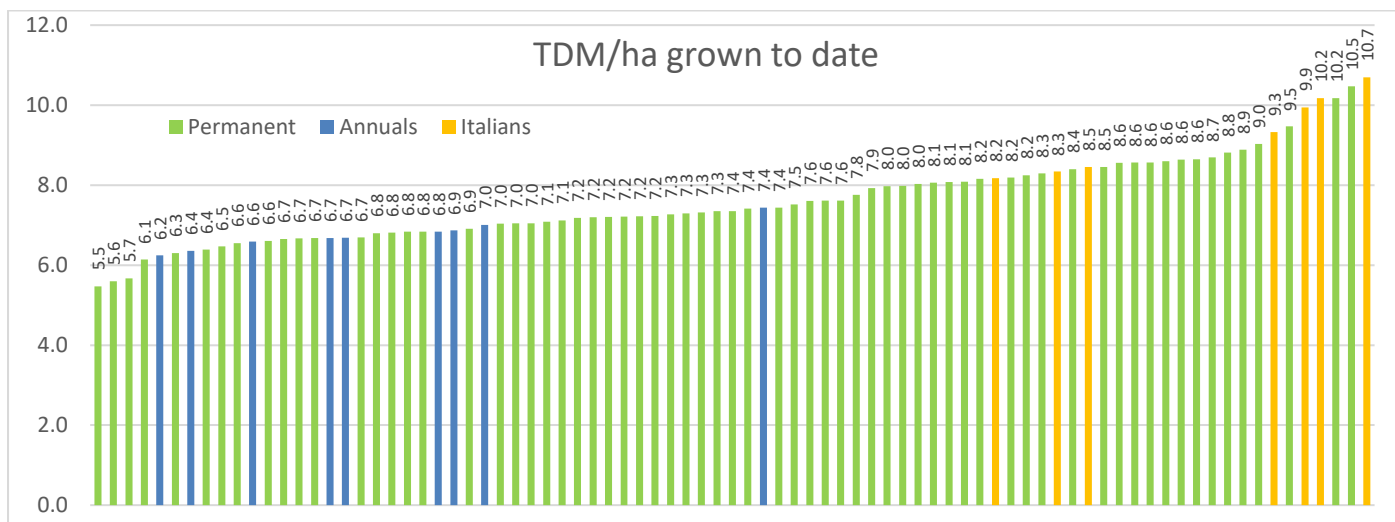
This year 0.4T/ha DM has also been harvested in silage, compared with 0.7TDM/ha harvested last year. This brings the total harvested of grass grown this year to 5.8TDM/ha versus last year of 5.5TDM/ha.

With the total of grass grown and eaten, plus harvested for silage, plus cover on hand eaten, the total for this year is 5.9TDM/ha versus 6.4TDM/ha last year, a net reduction in 8% of homegrown feed eaten this year. At present we do have 0.3TDM/ha more pasture cover on hand than the same time last year, to confuse the numbers further.



To date the range of pasture grown by paddock since 1 June is quite varied with: Annuals having grown 6.7TDM/ha, Italians 9.3TDM/ha and permanent pasture 7.6TDM/ha.

It should be noted that the performance of the annuals, still sitting above the bottom of this graph indicates the strength of growth they have given us – given they were all sprayed out at least 1month ago.



## NOTES

## FINANCIAL UPDATE

Financial performance year to date has seen a net change in profit to date of approximately \$114,000. This shows a pleasing improvement in gains from payout increase, productivity increase and expenditure reduction.

TO 31 OCTOBER	2015-16	2016-17	2017-18	VARIANCE	NOTES
<b>PRODUCTION</b>	74,353	70,697	75,654	4,956	Extra milk produced to end of October
<b>REVENUE</b>	\$310,617	\$301,147	\$373,997	\$72,850	Price, production and stock sales
<b>OPERATING EXPENDITURE</b>	\$342,199	\$340,754	\$327,985	(\$12,770)	Cash savings
<b>FINANCE AND LEASE</b>	\$112,680	\$91,395	\$62,551	(\$28,844)	Lower interest rates & higher lease
<b>TOTAL PROFIT/(LOSS)</b>	<b>(\$144,262)</b>	<b>(\$131,002)</b>	<b>(\$16,538)</b>	<b>\$114,464</b>	
<i>MILK PRICE RECEIVED</i>	\$3.37	\$3.89	\$4.44	\$0.55	Accrued revenue, advance rate this year only
<i>TOTAL REVENUE/KGMS</i>	\$4.18	\$4.26	\$4.94	\$0.68	Milk revenue improvements plus stock sales
<i>FWE/KGMS</i>	\$4.04	\$4.09	\$3.64	(\$0.44)	Cash farm working costs, reduction and dilution
<i>OPEX/KGMS</i>	\$4.60	\$4.82	\$4.34	(\$0.48)	Includes FWE and depreciation, admin
<i>PROFIT/KGMS</i>	<b>(\$1.94)</b>	<b>(\$1.85)</b>	<b>(\$0.22)</b>	<b>\$1.63</b>	

KEY PROFIT CHANGES	2015-16	2016-17	2017-18	VARIANCE	NOTES
<b>1. COMPARE MILK PAYOUT</b>	\$238,250	\$274,808	\$313,657	\$38,849	Net price paid on first 70,697kgMS each year
<b>2. REVENUE EXTRA KGMS</b>	\$12,319	\$0	\$21,989	\$21,989	Additional revenue, kgMS above 70,697kgMS
<b>3. CATTLE SALES</b>	\$17,861	\$14,643	\$20,856	\$6,213	17 vs 23 animals, no eczema culls
<b>4. CALF SALES</b>	\$9,023	\$8,294	\$12,646	\$4,352	Better bobby price, more calves to saleyards
<b>5. FEED</b>	\$63,371	\$62,939	\$56,476	(\$6,463)	Silage not yet made, more PKE purchased
<b>6. FERTILISER</b>	\$29,314	\$47,448	\$41,584	(\$5,864)	Less N used to date
<b>7. INTEREST</b>	\$96,545	\$81,565	\$48,416	(\$33,149)	Fixed Interest rates roll off

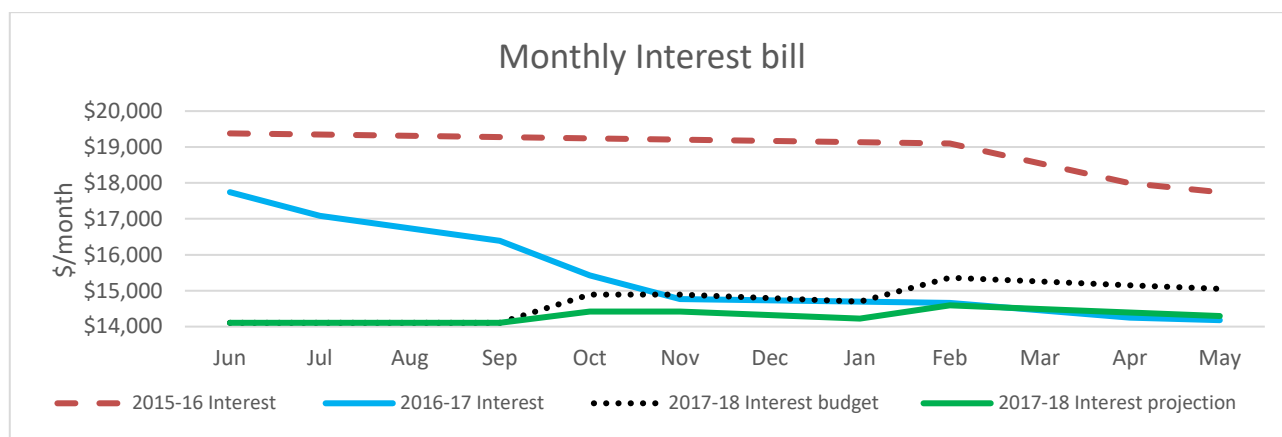
1. Large improvement in milk revenue has occurred as the advance rate is considerably higher.
2. In addition, there is an extra \$22,000 from production increases above last year.
3. Stock sales are improved. This is 17 culls YTD versus 23 the year prior, and \$6,000 in extra revenue which reflects the impact of Eczema damage in Autumn, coming through in to cows culled in spring at low BCS post calving.
4. Better bobby price, more calves sent for sale rather than bobby has significantly lifted calf sales.
5. Expenditure savings to date include reductions in feed due to less silage made – an advantage we hope not to retain, and lower cropping costs with a change in crop.
6. Fertiliser year to date is reduced with less N applied so far season to date.
7. Change in interest rate through fixed rates rolling off, and favourable floating rates coming in. Plus a reduction in term debt from last year's cash surplus.

## BENCHMARKING

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

Measure – to end of October	Total	/ha	/cow	/kgMS	\$/kgMS prev	Your Fig
<b>Total volume</b>	<b>Total</b>	<b>148</b>	<b>422</b>	<b>75,654</b>	<b>70,697</b>	
Total Labour Costs	68,525	463	162	0.91	0.93	
Animal Health	28,317	191	67	0.37	0.32	
Breeding	16,310	110	39	0.22	0.28	
PKE	24,992	169	59	0.33	0.22	
Grass Silage Harvested	712	5	2	0.01	0.23	
Purchased silage	5,919	40	14	0.08	0.18	
Cropping	5,906	40	14	0.08	0.16	
Calf Meal	5,839	39	14	0.08	0.09	
Fertiliser Spreading	2,130	14	5	0.03	0.01	
Fertiliser - Maintenance	17,979	121	43	0.24	0.18	
Fertiliser - Nitrogen	17,580	119	42	0.23	0.39	
Freight	3,895	26	9	0.05	0.09	
Re-grassing	13,108	89	31	0.17	0.00	
Heifer grazing costs	21,119	143	50	0.28	0.28	
Shed Expenses	1,838	12	4	0.02	0.13	
Electricity	6,761	46	16	0.09	0.08	
Water Charge	6,307	43	15	0.08	0.00	
R & M - Land & Buildings	8,334	56	19	0.11	0.16	
R & M - Plant & Equipment	8,099	55	19	0.11	0.16	
Vehicle Maintenance	4,239	29	10	0.06	0.09	
Petrol/Diesel	2,754	19	7	0.04	0.05	
Other Expenses	4,576	31	11	0.06	0.05	
<b>Total Farm Working Expenses</b>	<b>275,240</b>	<b>1,860</b>	<b>652</b>	<b>3.64</b>	<b>4.09</b>	

Having enjoyed favourable floating interest rates recently the rates being fixed are less than anticipated and forecast interest has reduced for the remainder of the season. The table below highlights the change in the last 3 years in thousands \$000s.



WESTPAC AGRIBUSINESS BENCHMARKING RESULTS 2016/17								
Sample Criteria	Sample size	46	Production share	100%				
	Location	All	Cow numbers	All				
					AgFirst			
					Top	OWL Farm	Average	
Customer details	Owned land area	ha		128	229	125		
	Lease area	ha		25	29	-		
	Total land area	ha		153	258	125		
	Effective milking platform	eff ha		146	219	125		
	Number of Cows			423	663	339		
Physical performance	Total Production	kgMS		178,294	249,204	123,479		
	Share of Production	kgMS		178,294	249,204	123,479		
		%	100%	100%	100%	100%		
	Physical Performance Ratios	kgMS/total ha	1,310	1,165	966	988		
		kgMS/eff ha	1,354	1,221	1,138	988		
		kgMS/cow	334	421	376	364		
Financial performance	Gross Farm Income (GFI)			\$1,139,225	\$1,541,835	\$770,303		
	Farm working expenses			\$664,857	\$922,101	\$470,037		
	Lease costs			\$33,927	\$10,250	\$0		
	Total farm costs (TFC)			\$698,784	\$932,351	\$470,037		
	EBITDA (EFS)			\$440,441	\$609,484	\$300,266		
					Top	OWL Farm	Average	AgFirst
Financial Performance Ratios	GFI/ha (eff ha) - milking platform		\$9,529	\$7,803	\$7,040	\$6,162		
	TFC/ha (eff ha) - milking platform		\$3,866	\$4,786	\$4,257	\$3,760		
	EFS/ha (eff ha) - milking platform		\$5,663	\$3,017	\$2,783	\$2,402		
	GFI/kgMS (prod. share)		\$7.04	\$6.39	\$6.19	\$6.24		
	TFC/kgMS (prod. share)		\$2.86	\$3.92	\$3.74	\$3.81		
	EFS/kgMS (prod. share)		\$4.18	\$2.47	\$2.45	\$2.43		
Notes:								
• EFS = net income prior to drawings, tax, depreciation, debt servicing, and capex. • Lease costs are included above the line. • Owners wages not included in costs.								
DISCLAIMER: The Westpac Agribusiness Benchmarking Results (2016/17) have been prepared by Westpac from records, information and instructions furnished to us by the customer. Neither the Bank nor any of its employees accept any responsibility for the accuracy of the material from which this has been prepared.								





# FARM ENVIRONMENT PLAN

**Healthy Rivers/Wai Ora Proposed Waikato Regional Plan Change 1 is the bold response to addressing the complex problem of water quality facing our Waipa and Waikato Rivers.**

The proposed plan change gives effect to Government legislation on the management of fresh water (passed in 2014) and Te Ture Whaimana o Te Awa o Waikato (The Vision and Strategy for the Waikato and Waipa rivers) which was adopted by Government as part of Treaty Settlement legislation. The regional council has a legal requirement to give effect to both of these.

Farm environment plans (FEP's) are a key aspect of the proposed plan change as they allow landowners to tailor their farm plan to suit the farm system, landscape/localised features and potential future changes. Farm plans help to identify areas where contaminants are lost, and put in mitigations are applied.

## Rule 3 - Farming activities with a Farm Environment Plan under a certified industry scheme

### Permitted activity (see activity table)

Properties, excluding commercial vegetable production, that do not come under rules 1 or 2, and are registered to a certified industry scheme and are registered (Schedule A) and stock excluded (Schedule C) must provide a Farm Environment Plan to Waikato Regional Council and adhere to it by:

- 1 July 2020 for priority 1 sub catchments, and properties with a Nitrogen Reference Point greater than 75th percentile nitrogen leaching value
- 1 July 2023 for priority 2 sub catchments,
- 1 July 2026 for priority 3 sub catchments,

Note: Industry schemes will have to be approved by Waikato Regional Council. Schedule 2 sets out the requirements for an industry scheme.

## Co-op launches water quality commitments

Fonterra is launching six commitments to improve water quality in New Zealand.



The six commitments are:

- 1) Farm within regional environmental limits
- 2) Encourage strong environmental farming practices
- 3) Reduce water use and improve wastewater quality at manufacturing plants
- 4) Build partnerships to improve waterway health
- 5) Invest in science and innovation to find new solutions
- 6) Make the products people value most

These commitments build on your significant efforts in this space. We're making sure that New Zealanders know that you have spent over \$1 billion on environmental initiatives over the past five years and you have fenced more than 98% of significant waterways on farm. That's a major undertaking and it highlights your commitment to getting this right.

Each of these commitments includes a set of clear actions. These actions include almost doubling our network of Sustainable Dairy Advisors who will work with you to make science-based changes on farm to make a tangible difference. We will also work with regional councils to set environmental limits for water use and we will investing \$250 million to drive a 20 per cent reduction in water use across our 26 manufacturing sites.

All intensive land uses have had an impact on water quality. That's why we have to work together to address the issue. Today, we're putting our hands up and promising to work with communities to promote healthy waterways for everyone to enjoy.

## Benefits from the FEP

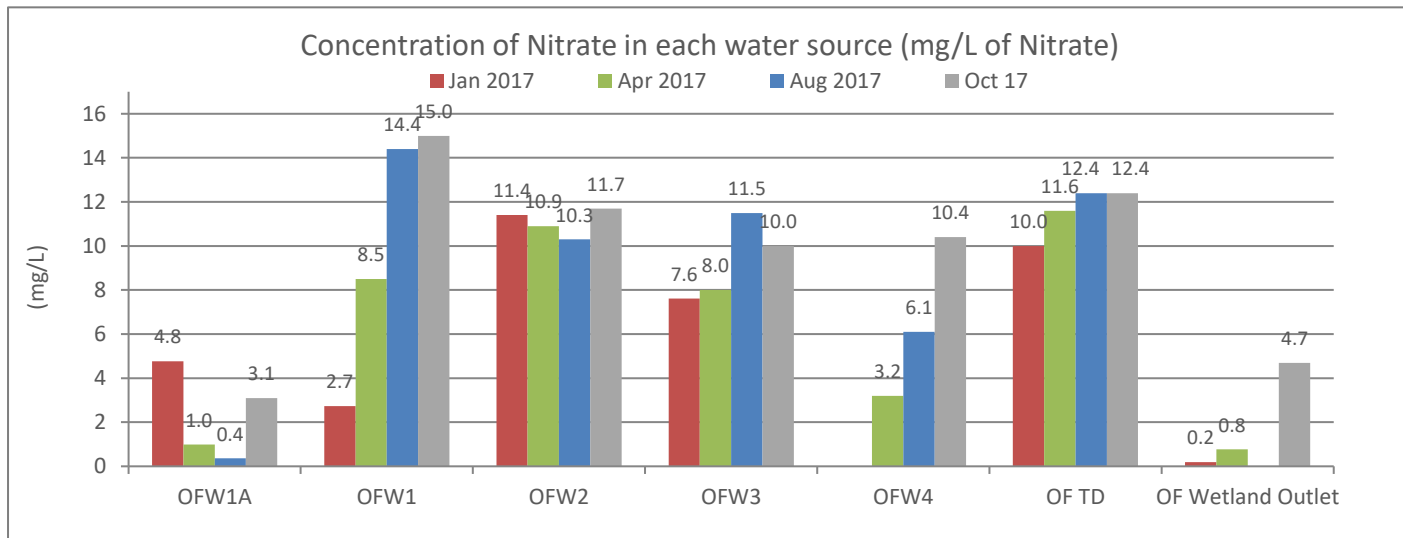
For Owl Farm the Farm Environment plan took about 4 hours in total, with a site visit and follow up report delivery. It removes the need for multiple documents governing how we manage environmental practices on the farm. It was also really useful to identify and discuss solutions for some of our little problem areas. The riparian planting tool gave us a good estimate of the budget required to plant out a few areas in the future. This is also really helpful from a planning point of view and ensuring funds are set aside to carry out the proposed ideas.

NOTES

## WETLAND UPDATE

Another round of testing of the wetland has shown that even after a very wet winter and spring, our constructed treatment wetland is continuing to remove substantial volumes of Nitrate from the water sources that supply it.

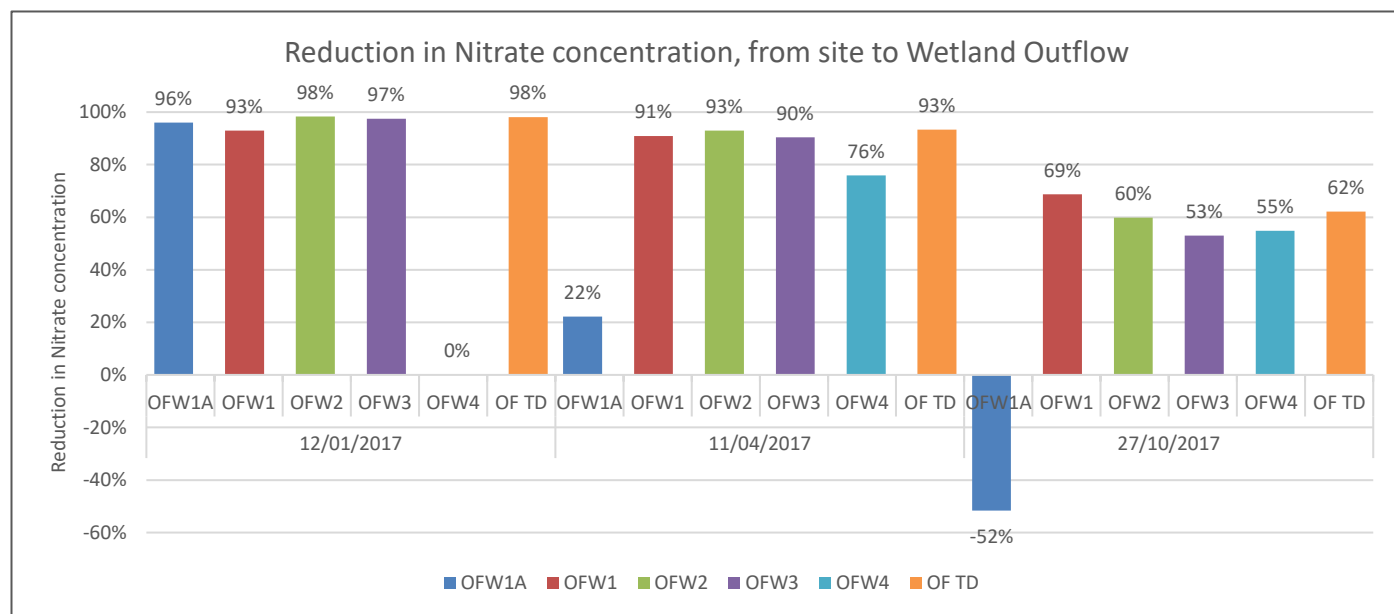
The total concentration of Nitrate as shown in the first graph largely crept as soil conditions got wetter. We also saw quite a large change at the wetland outflow in concentration.



While the % reduction in nitrate concentration for each site has dropped since the April samples, it is still far higher than was anticipated when the wetland was designed.

If you look at site OFW1A, this is our deep sample well. Water is collected from a depth of approximately 3m below the surface and it gives very different results to the rest of the wells which produce shallow water samples. In October, the well concentration was actually considerably LESS than the concentration at the wetland outflow.

There is a lot we still don't know about, but these results are again very promising.



Note, no outflow sample was obtained in August for comparison of the change in N concentration unfortunately.

NOTES

# SUMMER MANAGEMENT PLAN

Summer is always the season of making ends meet. We have very limited quantities of silage to feed, and are planning no more than 3kg/cow of PKE to assess our FEI position. Consequently we need to start feeding PKE in December to affect our total feed supply for Summer by pushing surplus grass ahead as cover or in the stack.

## FEED PLAN

The plan for the next 4 months from the feed budget is as follows.

- December begin feeding out PKE, increasing throughout the month. Hopefully achieve a second cut of silage in early December. When all grass area is back in the round, we will be on a minimum 27 day round of the farm using current area grazed of 5ha/day, hopefully extending round to 30 days by the end of the month.  
Apply early December **Sustain Nitrogen** at 40kgN/ha to bolster summer pasture on hand. Zinc in water now.

- January feed grass as available plus 3kg PKE/cow all month and 1kg silage. Approximately Jan 15<sup>th</sup>, start introducing and feed earliest Turnips climbing to 5kg/cow/day offered. With onset of turnips and reduction of grass allowed, round should edge out to 35 days.  
**Assess risk and determine timing of use of Zinc boluses for Eczema Protection.** Zinc in water now.

- February, follow rotation of 35 days, finish early turnips and move directly to Clean Crop bulbs approx. 5<sup>th</sup> February, and onto Clean crop Rape approx. 25<sup>th</sup> February. Pasture silage allocation increased to 2.5kg/cow.

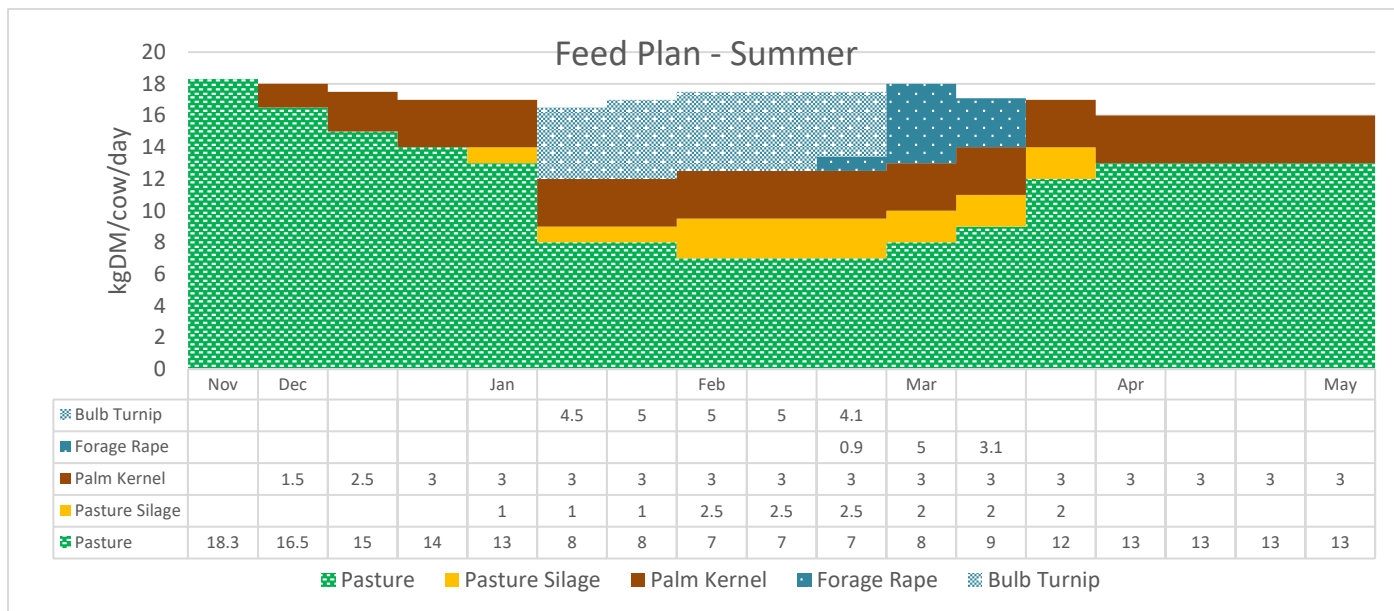
Depending on the summer rain supply we may experiment with our PKE use to see what happens when we feed 2kg vs 4kg of PKE over summer with Turnips, but the average will be 3kg/cow/day.

**Assess risk and determine timing of use of Zinc boluses for Eczema Protection.** Zinc in water now.

- March, finished clean crop Rape approx. 10 March, silage reduces to 2kg/cow for all of March and then will cease as remainder will need to be kept for winter. At this point we are anticipating Autumn rains, and increases in pasture cover.  
**Assess risk and determine timing of use of Zinc boluses for Eczema Protection.** Zinc in water now.

- Routine OAD for the whole herd is not anticipated, as we expect feed levels to be sufficient to sustain twice daily milking and protect Body condition score. At risk cows will be monitored and a portion of the herd will likely be milked OAD in the herd, as has been happening all season. If pasture cover drops below anticipated levels, this perspective will adjust as necessary.

The graph below shows the feed types planned throughout the summer. We are budgeting a Turnip yield of 12TDM/ha. Should we exceed our expectations we will increase daily turnip allowance to 6kgDM/cow/day offered and for an extended period.



On the small parcels of land we lease but cannot graze, described as our "run off" we are growing a Sorghum crop to generate bulk feed for winter. These areas are otherwise baled for silage, but are wasteland pasture and predominantly buttercup and Dock. We hope that via this crop rotation we can generate more feed, of better quality and create a further feed supply for use over the winter. This is noted as brought in feed, in all calculations for the farm.

The key to remember is that in our current system, we have a total amount of feed hand to utilise and a limited budget to purchase PKE or any other substance to feed cows throughout the remainder of this year.

NOTES



## PKE AND SILAGE AT THE SAME TIME

Below are the numbers regarding the decision to feed out PKE in December when we still have a pasture surplus on hand. We have looked at three different scenarios for getting through based on the sum of all resources we have available. Note, we will only cut a genuine surplus, as ever it is a tool to manage our feed wedge.

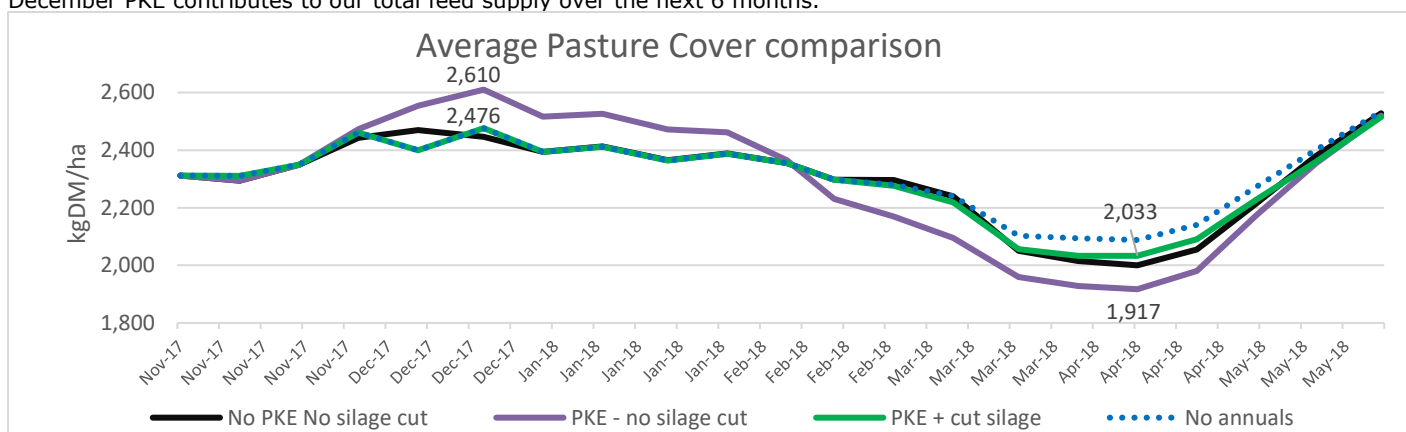
*Option 1 – feed PKE, bank the 2<sup>nd</sup> cut of silage and get to winter with silage on hand and options.*

*Option 2 – feed PKE, carry the extra feed through in cover to summer. But risk a growth deficit as very long covers are grazed of likely quite poor quality. This will likely lead to having quite low supplement on hand for winter.*

*Option 3 – don't feed PKE in December and don't make silage! This reduces our total feed supply by 30T until Winter and we have close the year with no silage on hand but we can buy more PKE going in to winter.*

### Feed budget

The graph below highlights the implications of our decision to start feeding PKE in December AND cut silage at the same time. The December PKE contributes to our total feed supply over the next 6 months.



The 30T fed in December is critical in the whole season feed budget and with a plan to remain within the 3kg/cow/day limit, this is the only way to feed enough between now and calving, unless we feed 5-6kg/cow to dry cows in June.

We are choosing to use our total set of resources in a way that we feel gives us the best flexibility. Should a dry summer turn up, we can't go back in time and feed out more PKE!

### Financial results

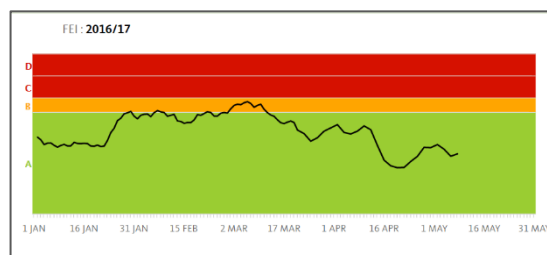
Having used FARMAX to model all scenarios, the change in milk production, change in costs and the change in feed on hand for winter is summarised in the table below.

	No PKE in Dec, No silage cut	PKE - no silage cut	PKE + cut silage
Milk Production	174,244	174,148	176,541
Feed on hand for winter spring TDM	0	8	36
Maximum cover Nov-Apr	2,470	2,610	2,476
Minimum cover Nov-Apr	2,000	1,917	2,033
Ave dry off date	30-Apr	26-Apr	01-May
Milk revenue reduction \$6.75/kgMS	-\$15,505	-\$16,153	\$0
Feed cost reduction (silage and PKE)	-\$15,521	-\$7,808	\$0
Cost to replace winter feed stores (PKE used)	\$9,720	\$7,560	\$0
Net cost versus chosen option	-\$9,704	-\$15,905	\$0

### Feed types and FEI impact

Whilst this year the FEI grades are only advisory this is the only window we will get for an experiment of where the limits for our farm are with a PKE and Turnip feed combination.

Note, the image here is of our FEI last Autumn with PKE at approx. 3.6kg plus Chicory, silage and Maize being fed. A very different diet to the one planned this year.



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## CLEAN CROP

# A SIMPLE WEED MANAGEMENT SYSTEM

The **Cleancrop™ Brassica System** (seed + herbicide) package enables you to control your weeds at the time of sowing.



### CLEANCROP™ BRASSICA SEED

Cultivars that have been bred to be tolerant to the sulphonyl urea herbicide Telar®



### DuPont™ Telar® HERBICIDE

A broad spectrum herbicide that provides excellent control of broadleaf weeds from the pre-emerge stage

Telar® herbicide controls these weeds:

- Calandrinia
- Californian Thistle\*
- Chickweed
- Cornbind
- Dandelions
- Docks
- Fathen
- Hawksbeard
- Nodding Thistle
- Rayless Chamomile
- Redroot
- Scarlet Pimpernel
- Scentless Chamomile
- Scotch Thistle
- Shepherd's Purse
- Spurrey (Yarr)
- Stinking Mayweed
- Twin Cress
- Vetch
- White Clover
- Wild Turnip\*
- Willow Weed
- Yellow Gromwell

\*Apply Telar® post-emerge when Cleancrop™ brassicas are at the fourth-true leaf stage.

Apply Telar® at the pre-emerge stage within 48 hours of sowing

## HOW DOES CLEANCROP™ WORK?

Cleancrop™ brassica cultivars are unique as plants have been **BRED TO BE TOLERANT** to Telar® for excellent weed control. Telar® cannot be used with conventional brassicas.



**PREPARE Paddock**



**PLANT CLEANCROP™**



**SPRAY WITH TELAR®**



**CONTROL WEEDS** within 48 hours of sowing\*

**NO MOISTURE REQUIRED** to activate Telar® herbicide

**NO SOIL INCORPORATION REQUIRED**

**ADAPTABLE TO METHOD OF SOWING**

\*Telar® can be applied at the post emergence stage when brassicas are at least at the fourth-true leaf stage. Refer to the table above.

## Rape

Cleancrop™ Brassica System



**Days to Grazing:**  
90-110



**Sowing Rate:**  
4 kg/ha

**HIGH YIELDING MULTI-GRAZE FORAGE RAPE**

**MULTI-PURPOSE FORAGE RAPE**

**GOOD REGROWTH POTENTIAL**



## Bulb Turnip

Cleancrop™ Brassica System



**Days to Grazing:**  
80-110



**Sowing Rate:** 2 kg/ha (Summer) OR 1 kg/ha (Winter)

**HIGH YIELDING BULB TURNIP**

**SUITABLE FOR SOWING FROM LATE SPRING**

**SUITABLE FOR SUMMER/AUTUMN/WINTER FEED**



**Need more feed?** Contact your local seed retailer, go to [www.pggwrightsonseeds.com](http://www.pggwrightsonseeds.com) or Freephone 0800 805 505

**PGG Wrightson Seeds**



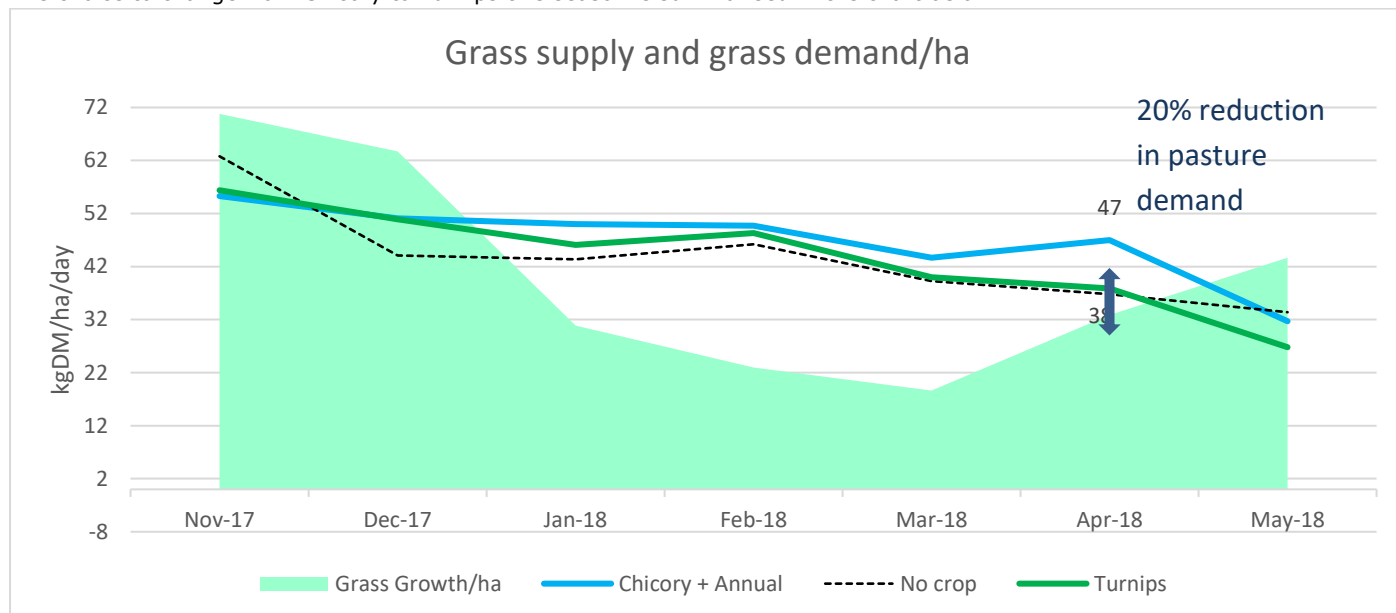
## SUMMER FEED STRATEGY

The shape of our Summer-Autumn demand curve is critically important. Because of the shape of the feed supply (multi graze for Chicory vs, single graze for Turnips), and the timing of the final grazing of the crop, Chicory no longer fits our system as well when we have no Maize in the system to support the Autumn feed budget.

It's important to note, that Chicory is and was a great crop for us, when we had so much regrassing work to get done as it allowed a much faster renovation program. But our needs have changed.

With a lower input system this year; a smaller area out of grass, with all feed available in the dry weather period and back into new grass a month earlier, Turnips are great fit for Owl Farm now.

The choice to change from Chicory to Turnips this season is summarised in the chart below.



### Clean Crop Brassicas

The other advantage with a brassica crop, is the advancements made in weed control in and around the crop. We are using both Barkant turnips, Clean Crop Bulb Turnips this year along with Clean Crop Rape.

The clean crop varieties are herbicide tolerant, allowing effective weed management via residual herbicides to control weed species. This also means we are likely to have less requirement for the need to send paddocks through a full annual ryegrass crop ahead of the summer crop which also eases pressure on the Autumn feed budget.

The table below highlights the crop costs required for the farm, and for Chicory and Barkant still need a full cycle through annuals to beat our pasture weeds. The upshot is, in good payout years, the economic value of sowing Annuals may be well worth the while, but in years where money was tight we could successfully establish high quality pasture direct through a summer crop.

Full crop costs from old grass to new grass					
Item	Annuals	Chicory	Barkant turnips	Clean Crop Turnips	Clean Crop rape
Spray out	69	69	69	69	69
Seed	211	225	100		
Seed & pre-emerge herbicide				225	195
Cultivate/Sowing	140	230	230	230	230
Fertiliser DAP + N	130	287	287	287	287
Post emerge herbicide		126	135		
Insecticide + slug bait	86	86	120	120	120
Total crop cost/ha	636	1,023	941	931	901
New grass cost/ha	-	915	915	915	915
<b>Total cost/ha Crop + new grass</b>	<b>636</b>	<b>1,938</b>	<b>1,856</b>	<b>1,846</b>	<b>1,816</b>
Yield June - May Crop	9,120	12,000	12,000	12,000	12,000
Potential grass yield during crop	4,560	4,120	4,120	4,120	4,120
Net yield benefit	4,560	7,880	7,880	7,880	7,880
Total cost for Owl Farm crop	10,812	32,946	18,560	18,460	18,160
Total cost for best quality new grass		43,758	24,920	18,460	18,160

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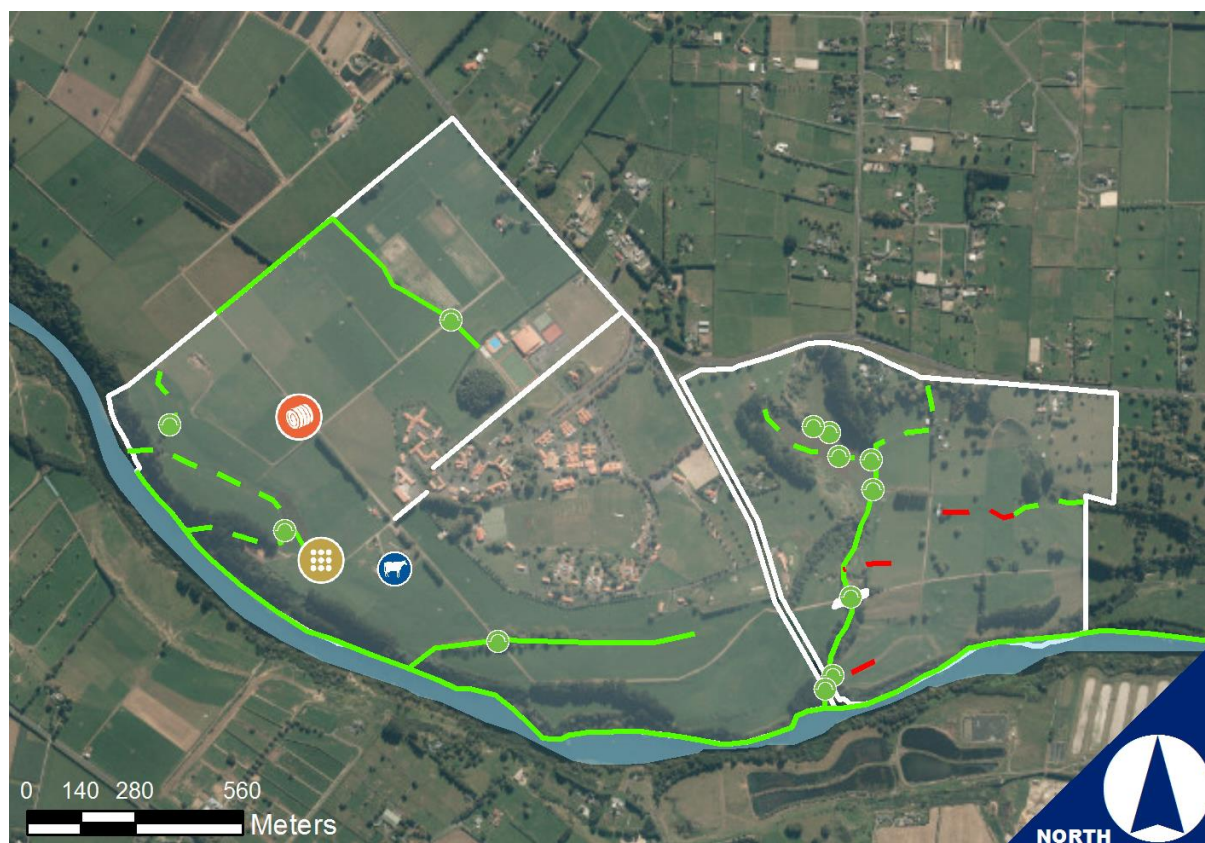
# Farm Environment Plans








## FARM ENVIRONMENT PLAN – EXAMPLE OWL FARM

A Fonterra Farm Environment Plan is tailored to a specific farm, with visual elements enabled by leading technology.

### Image 1: Summary map

Our mapping software can capture and display various layers of information to cover a variety of different requirements. This can include key features as well as your management blocks.



- |  |  |
|--|--|
|  Accord Defined Stock Excluded Waterway         |  Shed Location                              |
|  Current Effluent Pond                          |  Compliant Crossing                         |
|  Non-Accord Defined Stock Not Excluded Waterway |  Non-Accord Defined Stock Excluded Waterway |
|  Silage stack                                   |  |

**Farm Environment Plans**  
November 2017



# Farm Environment Plans

**Image 2: Effluent Irrigation section of the Owl Farm FEP**

Each critical source area is photographed, clearly described and assessed in terms of the level of risk. Our SDAs work with the farmer to set practical actions to effectively address any identified risks with reasonable implementation timeframes

## Effluent Management

### Effluent Irrigation - Effluent irrigation system

<b>Risk Rating</b>	<b>Medium</b>
Contaminant Loss Risk:	<div><div></div></div>
Risk of reaching surface water:	<div><div></div></div>

<b>Description</b>	Effluent currently drains via multiple grates in the yard and farm dairy to two sediment traps before going into an in-ground effluent sump. From here effluent is either pumped directly to land when conditions suit via a cobra travelling raingun or diverted via an overflow pipe in sump to an effluent pond where it can be stored until conditions suit land application. GMP: Solids from the sediment traps are spread directly to land via a muck spreader when conditions suit.
<b>Irrigation method</b>	Travelling irrigator
<b>Application depth</b>	<12 Millimetres
<b>Application depth testing</b>	Yes > annually
<b>Solids Management</b>	Spread via muck spreader



#### Open Actions:

Target Date	Category	Feature Type	Action Name	Risk Rating
Ongoing	Effluent	Effluent Irrigation	Effluent Irrigation Buffer Zones	Medium
Description:	Ensure buffer zones are built in around waterways and boundaries when placing effluent irrigator runs to prevent potential water way contamination and odour issues from neighbours.			
Ongoing	Effluent	Effluent Irrigation	Irrigator maintenance	Medium
Description:	Ensure irrigator and pump are greased and maintained monthly and serviced annually. Observe hydrants, mainlines and the drag hose regularly to ensure there are no leaks. Complete annual application depth and rate test to ensure appropriate levels are being applied.			



# Farm Environment Plans



**Image 3: Race Management section of the Owl Farm FEP**

Each critical source area is photographed, clearly described and assessed in terms of the level of risk. Our SDAs work with the farmer to set practical actions to effectively address any identified risks with reasonable implementation timeframes

## Land Management

### Race Management - Crossing by Te Awa Cycleway/Walkway

**Risk Rating**

**High**

Contaminant Loss Risk:



Risk of reaching surface water:



#### Description

This is a low point in the race where runoff drains from either side. Although the scale of loss isn't significant it is directly discharging to an area above a water course. This is also visible from the Te Awa cycleway/walkway which heightens the risk from a perception perspective.

**Contaminant risk type** Phosphorus

**Proximity to surface water** 10 Metres

**Contaminant risk type** Sediment

**Contaminant risk type** Microbial Pathogens



### Open Actions:

Target Date	Category	Feature Type	Action Name	Risk Rating
29 Nov 2017	Land	Race Management	Dig Cut-out both sides of race	High
Description:		Dig several cut-outs into both sides of race leading towards the crossing from both directions. Shifting cuts further up the race allows any runoff to flowing through considerable vegetation prior to reaching water. This will allow for uptake nutrients and filtering of sediment.		

**Farm Environment Plans**

November 2017



## WE ARE HERE TO HELP

In the Waikato region, the Healthy Rivers Plan Change (PC1) will require all affected dairy farmers to have – and to operate in accordance with – a Farm Environment Plan (FEP). Through the Tiaki Sustainable Dairying Programme, our SDAs work with Fonterra farmers who would like an FEP for their farm.

Fonterra is committed to supporting its farmers as they manage and maintain New Zealand's environment for generations to come.

The Tiaki Sustainable Dairying Programme develops and delivers solutions to help Fonterra farmers reach their environmental goals.

Our Sustainable Dairying Advisors (SDAs) have specialised regional knowledge and expertise. They provide farmers with one-on-one support, tailored services and resources to meet regional requirements and individual on-farm needs.

### FARM ENVIRONMENT PLANS

#### HOW IT WORKS

1. During a one-on-one visit to your farm, your SDA reviews your farm's information and map to identify critical source areas or identify opportunities for improvement.
2. Together with you, they walk your farm property to look at terrain, waterways, the size and complexity of your farm, underpasses, effluent system, grazing management, cropping regimes, nutrient management, water use and more.
3. Throughout the visit, you and your SDA discuss any areas for improvement and reasonable timeframes to complete improvement actions.
4. Your SDA documents the good management practices that are already underway, and any identified environmental risks and agreed actions in your Farm Environment Plan.

#### GARRY'S FEP EXPERIENCE

When Waikato farmer Garry Reymer was invited to take part in the Farm Environment Plan pilot programme, he recognized it as an ideal opportunity to keep the ball rolling with his on-farm sustainability.

Garry appreciated how the FEP was individualised to his farm, including maps and photos of critical locations around the property. Garry stated, "If I had to do it myself the enormity of the task would probably just seem too much. Fonterra has the resources, they know what's got to be done, and they've done plenty of them."

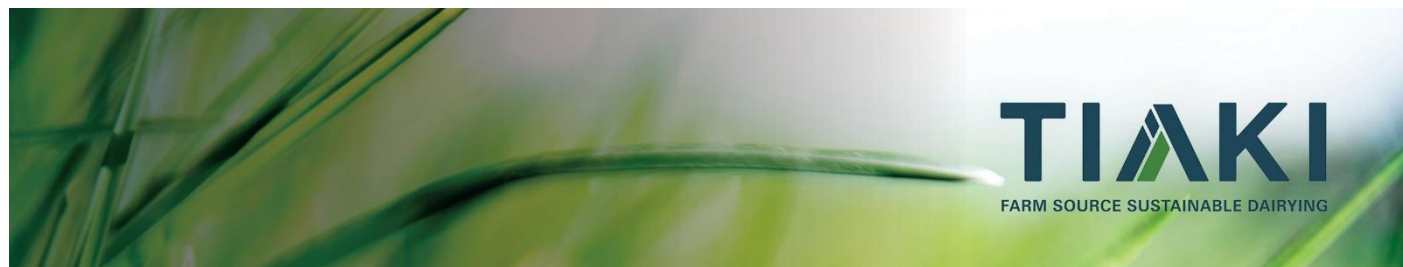
"It was good to be able to work with a trusted entity, like Fonterra. It gave me confidence it was going to be done properly, done right, with people I know."

#### REQUEST YOUR FARM ENVIRONMENT PLAN

To request an FEP for your farm or learn more about other Tiaki Sustainable Dairying services, contact your Sustainable Dairying Advisor or call 0800 65 65 68.

CONTACT US FOR MORE  
INFORMATION

sustainable.dairying@fonterra.com  
19 Home Straight, Te Rapa, Hamilton  
T 0800 65 65 68  
nzfarmsource.co.nz | fonterra.com



## 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 plate metering will keep us fit and focussed, along with giving a second validation of pre-grazing and post grazing covers to ensure we maximise our 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 platometer, 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](mailto:theresa@owlfarm.nz) or phone: 07 827 9738**

[www.owlfarm.nz](http://www.owlfarm.nz)



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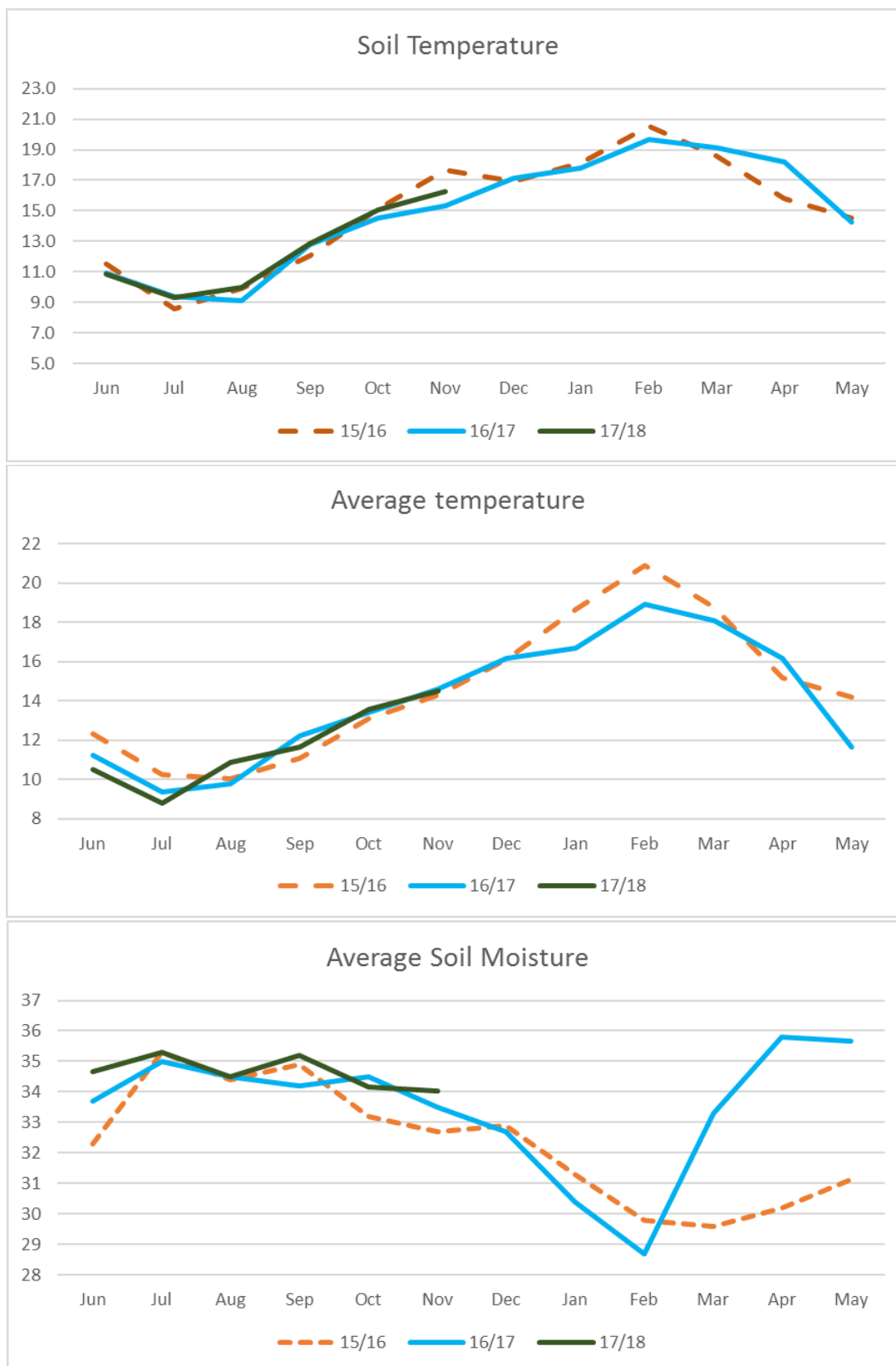
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## CLIMATE AND FEED DATA

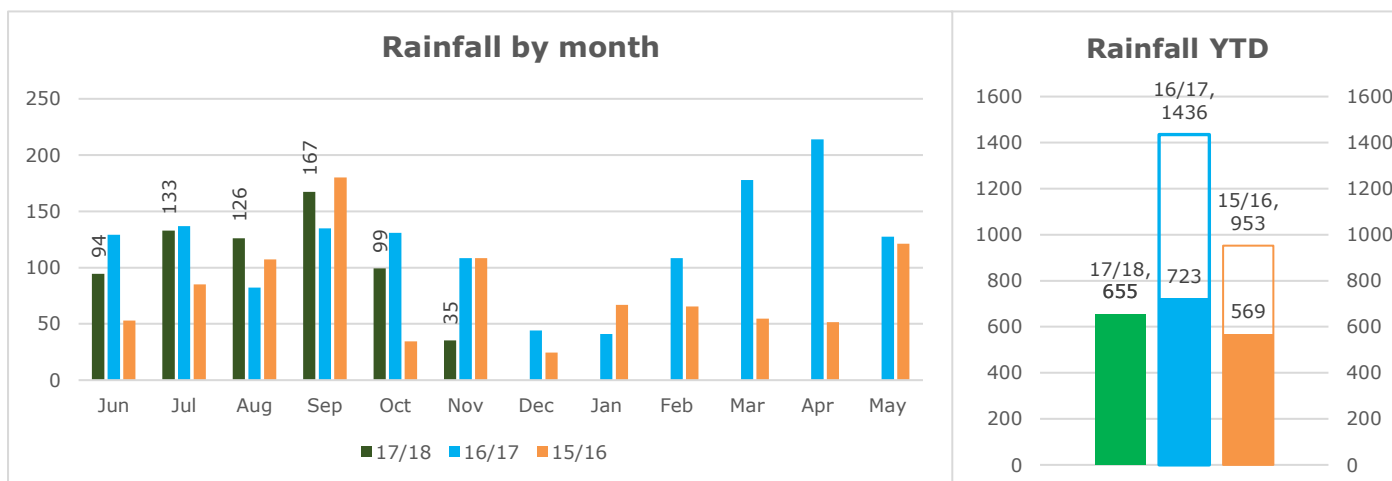


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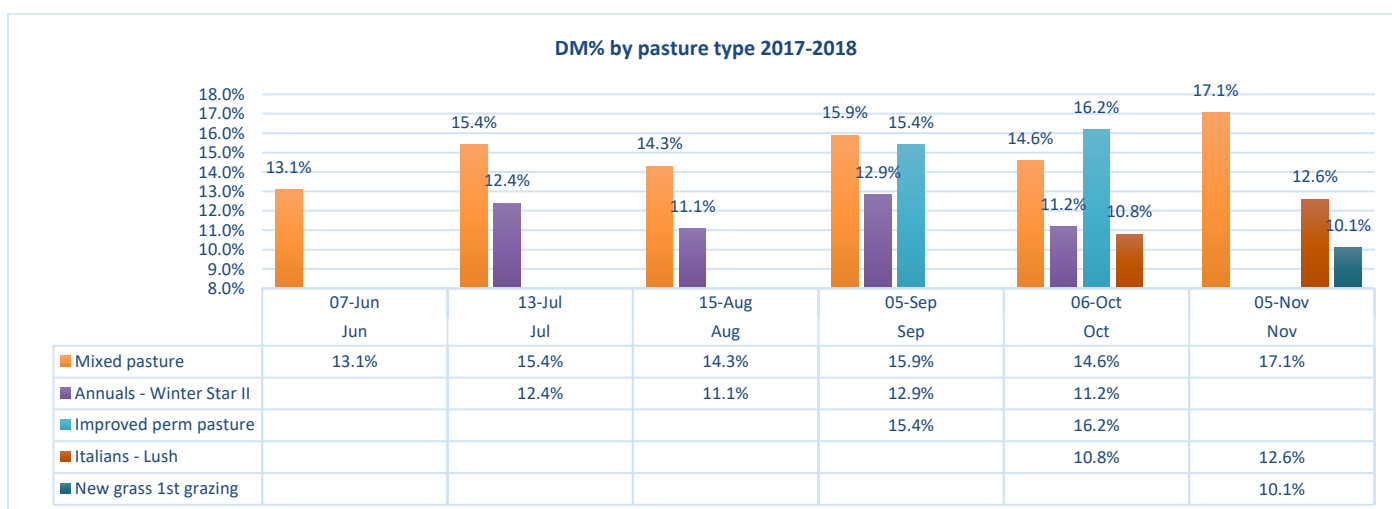
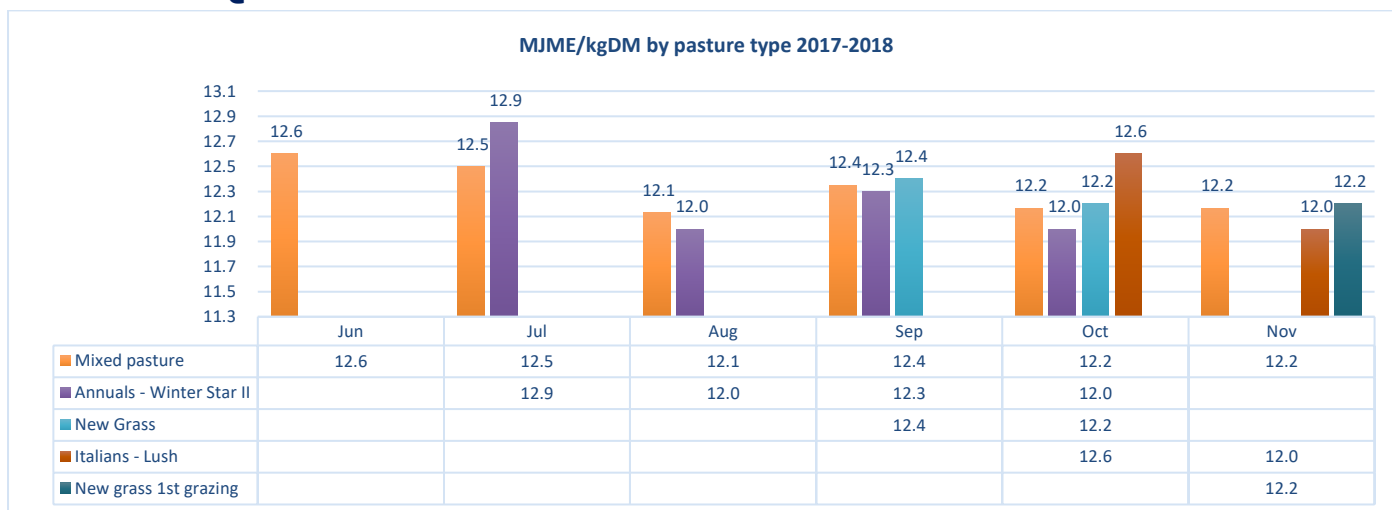




## RAINFALL



## PASTURE QUALITY



### NOTES

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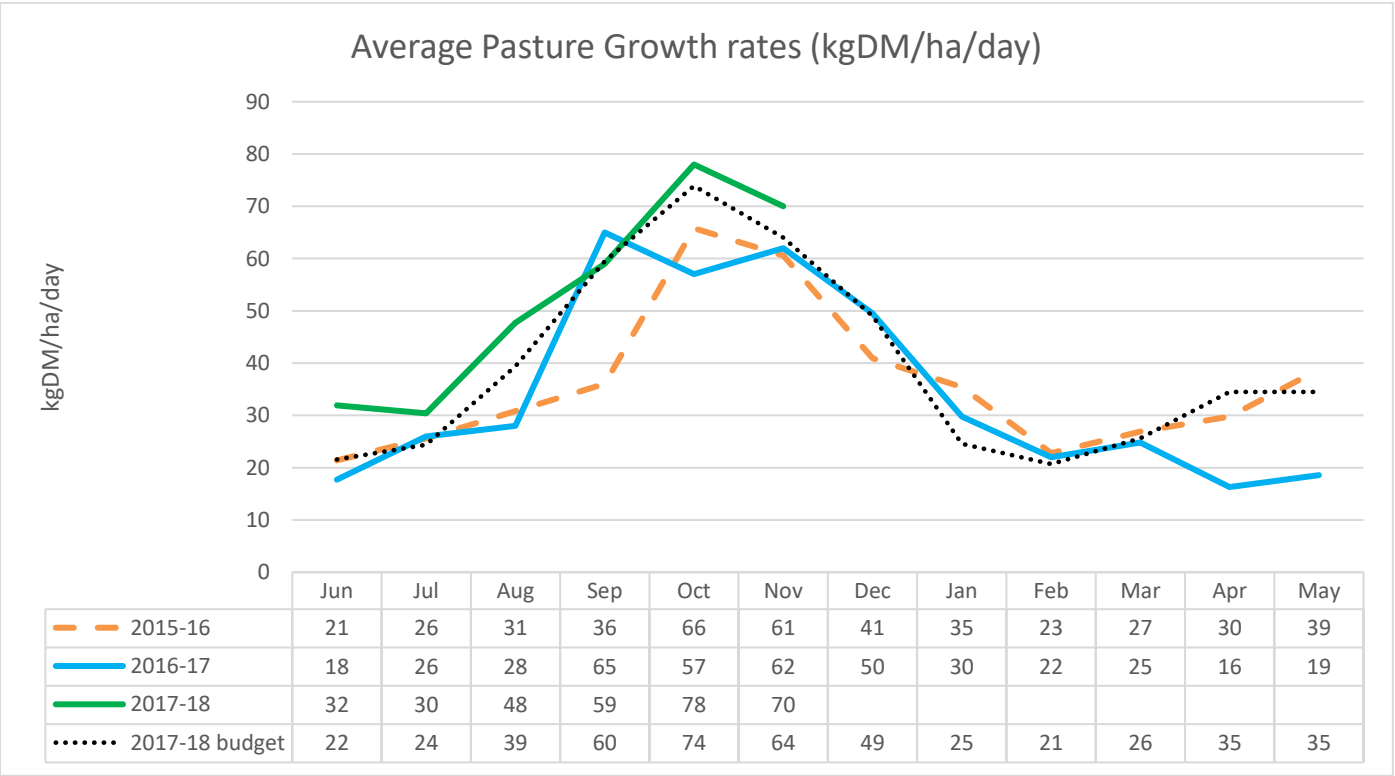
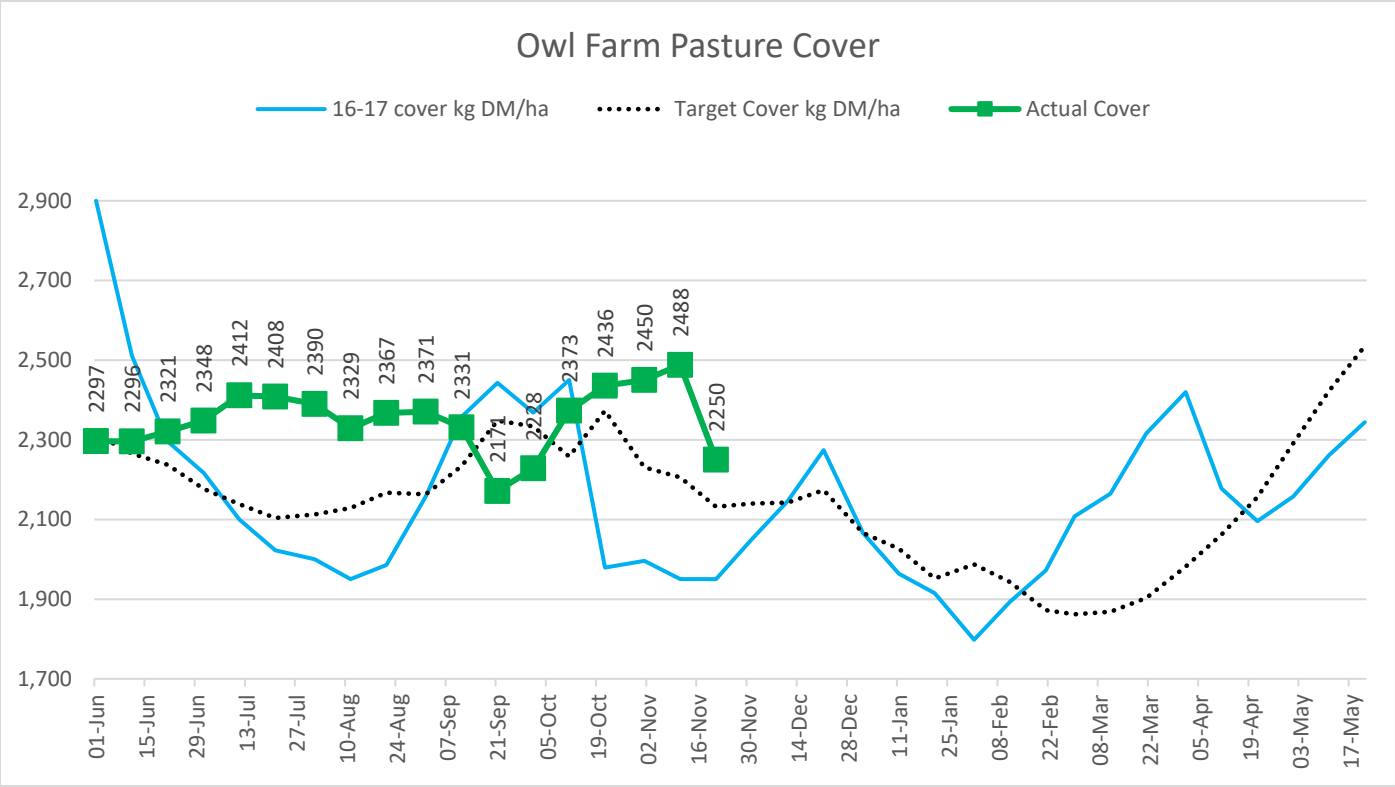
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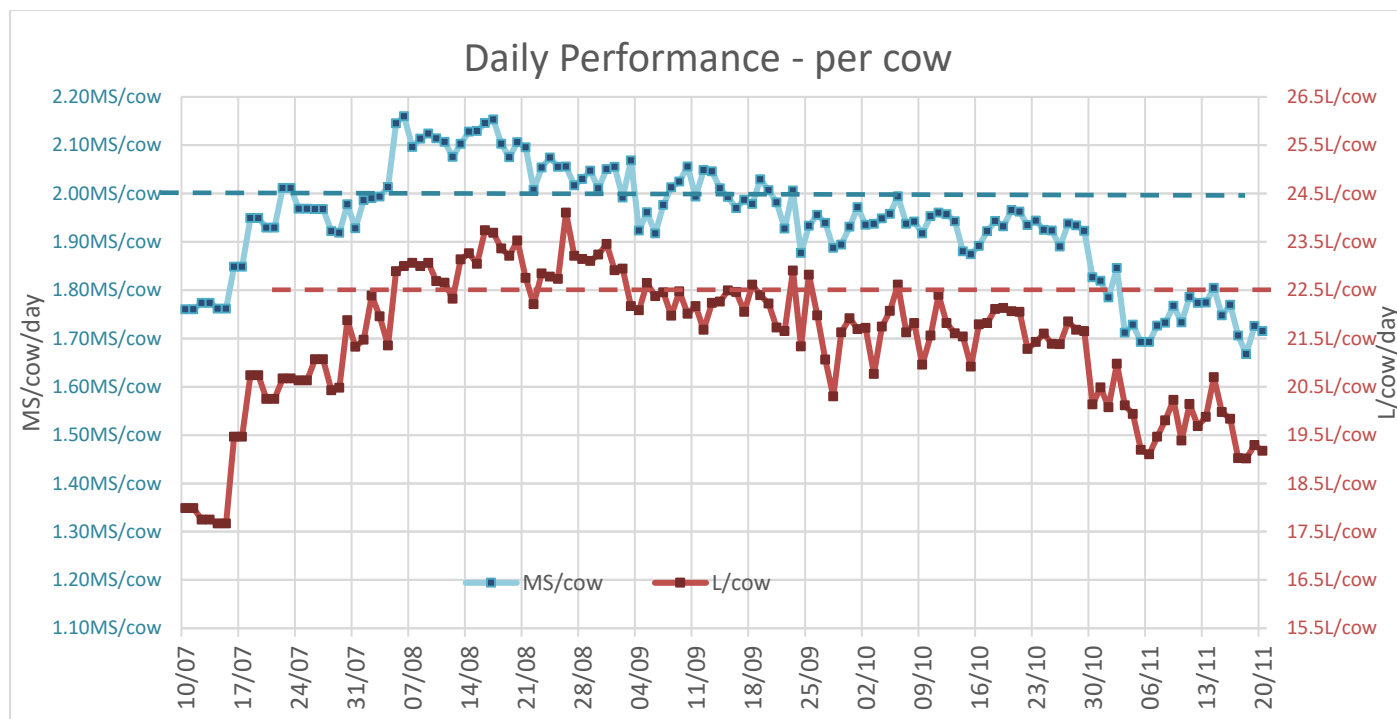
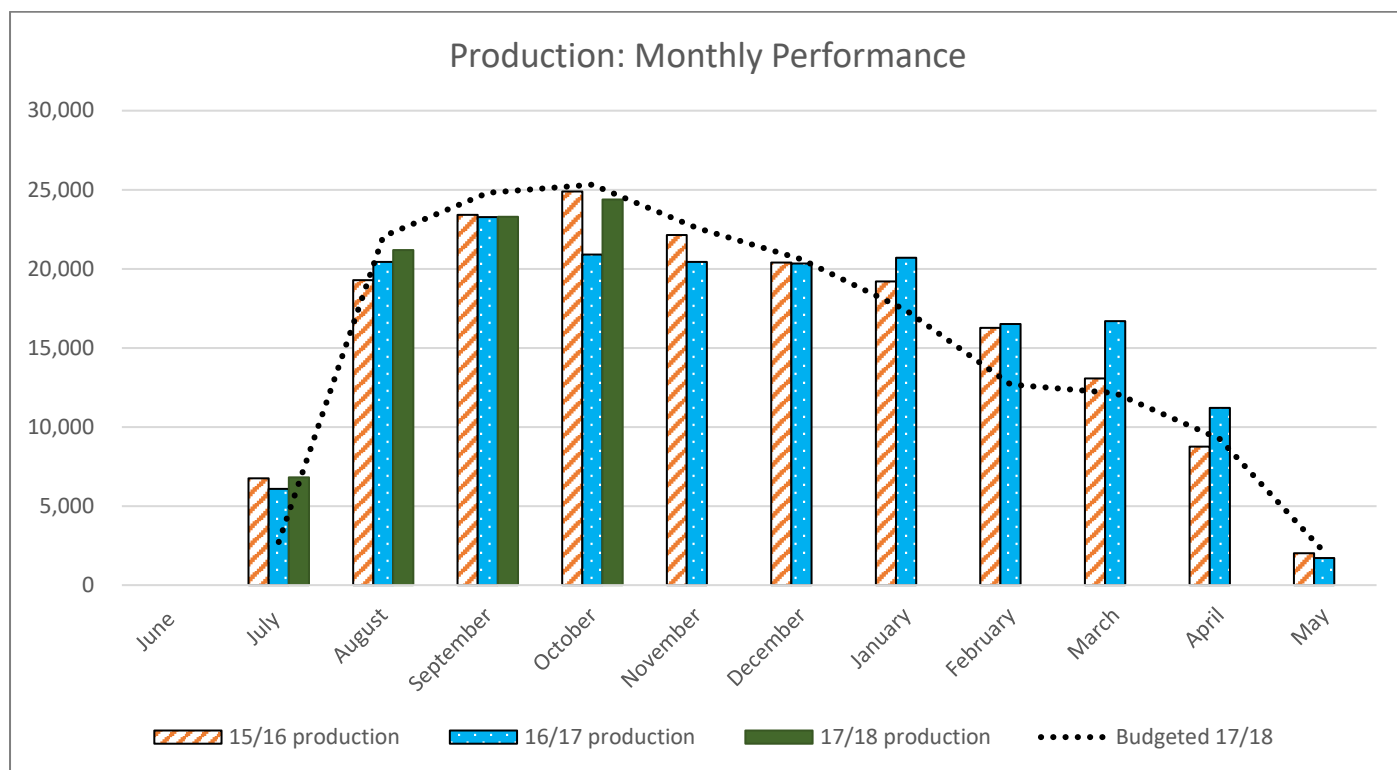
FEED INFORMATION



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## SUMMARY DATA PRODUCTION AND COWS

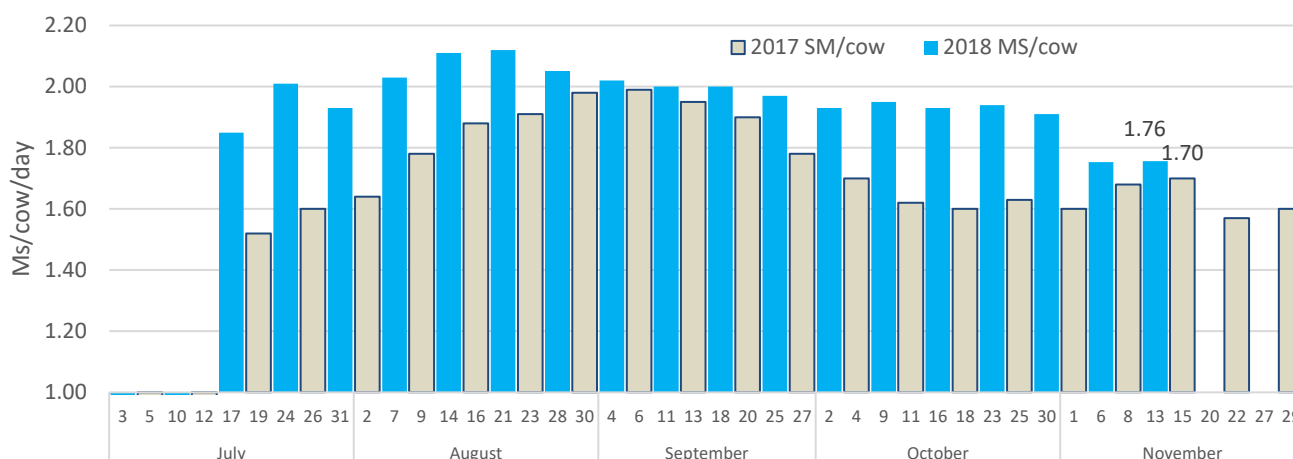


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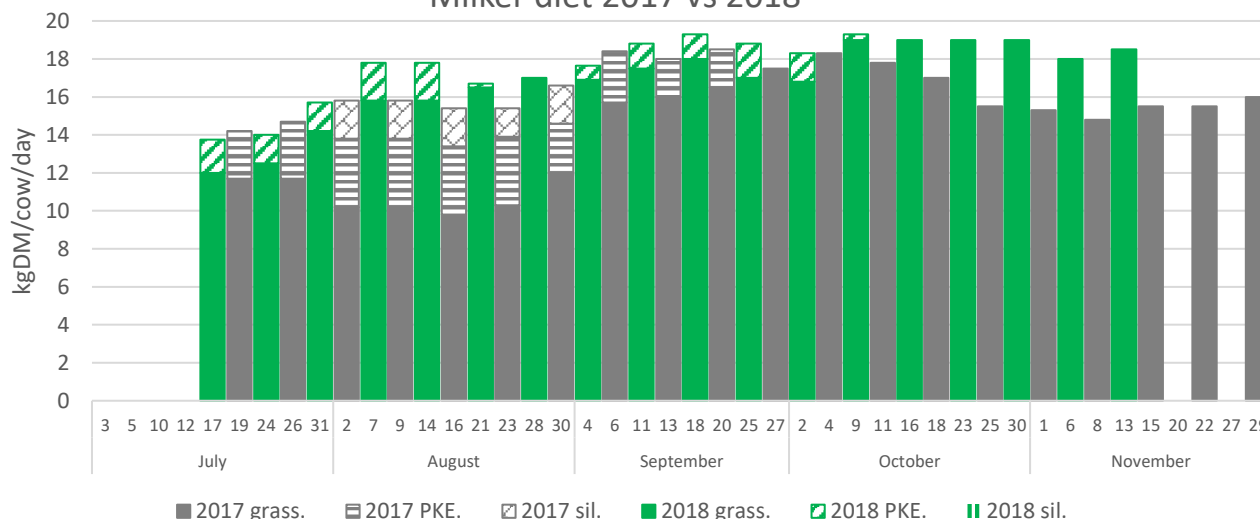


## SUMMARY DATA

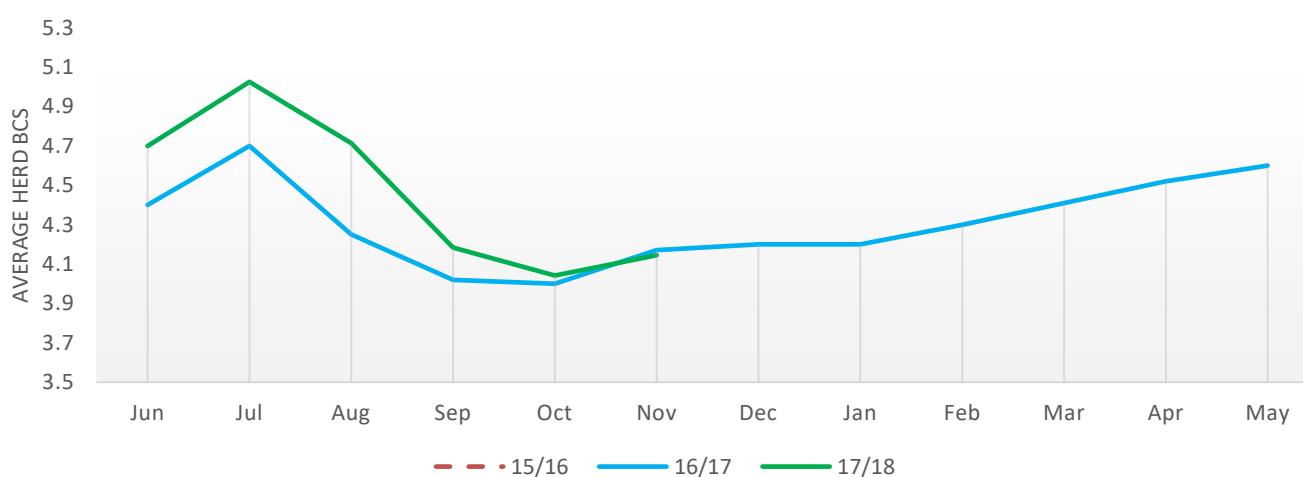
### Milksolids production per cow/day compared to last season



### Milker diet 2017 vs 2018



### Monthly Body Condition Score

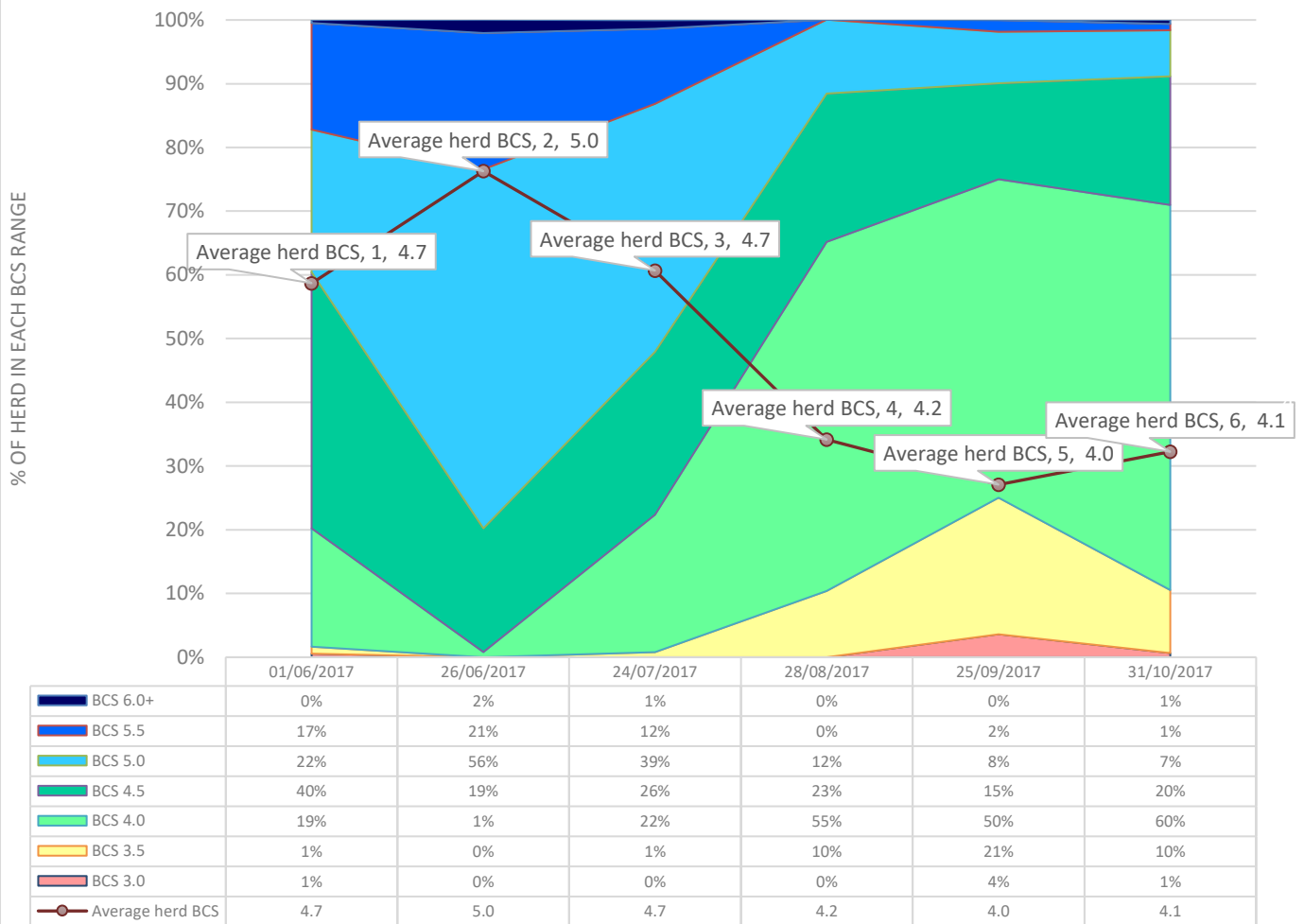


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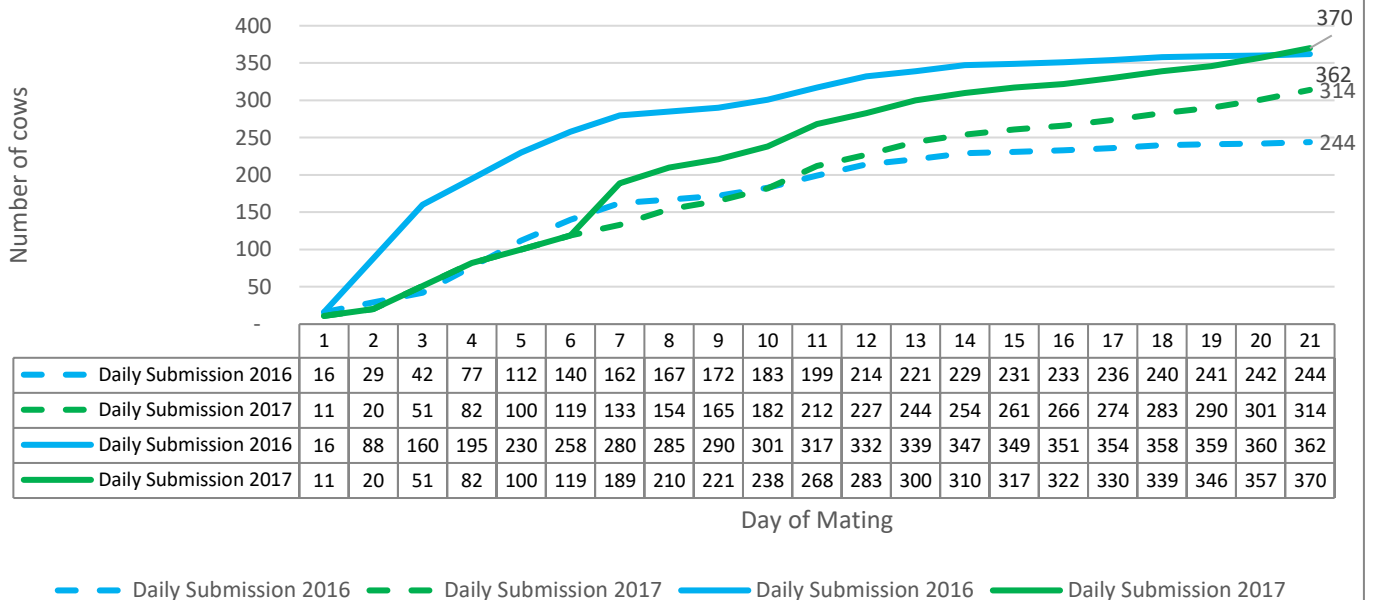




## BCS distribution of herd 2017-2018



## 3 week Submission rate comparison including and excluding CIDR cows

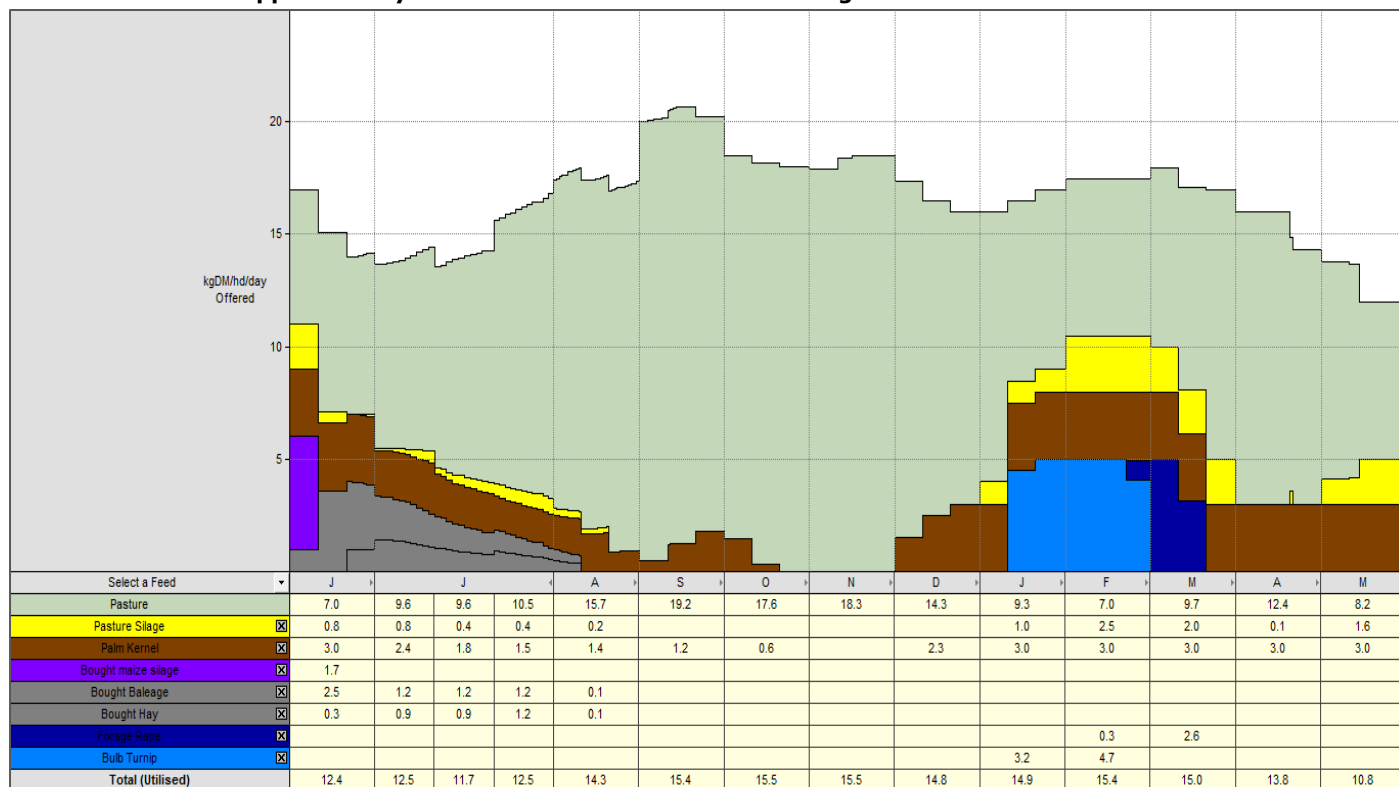


## NOTES

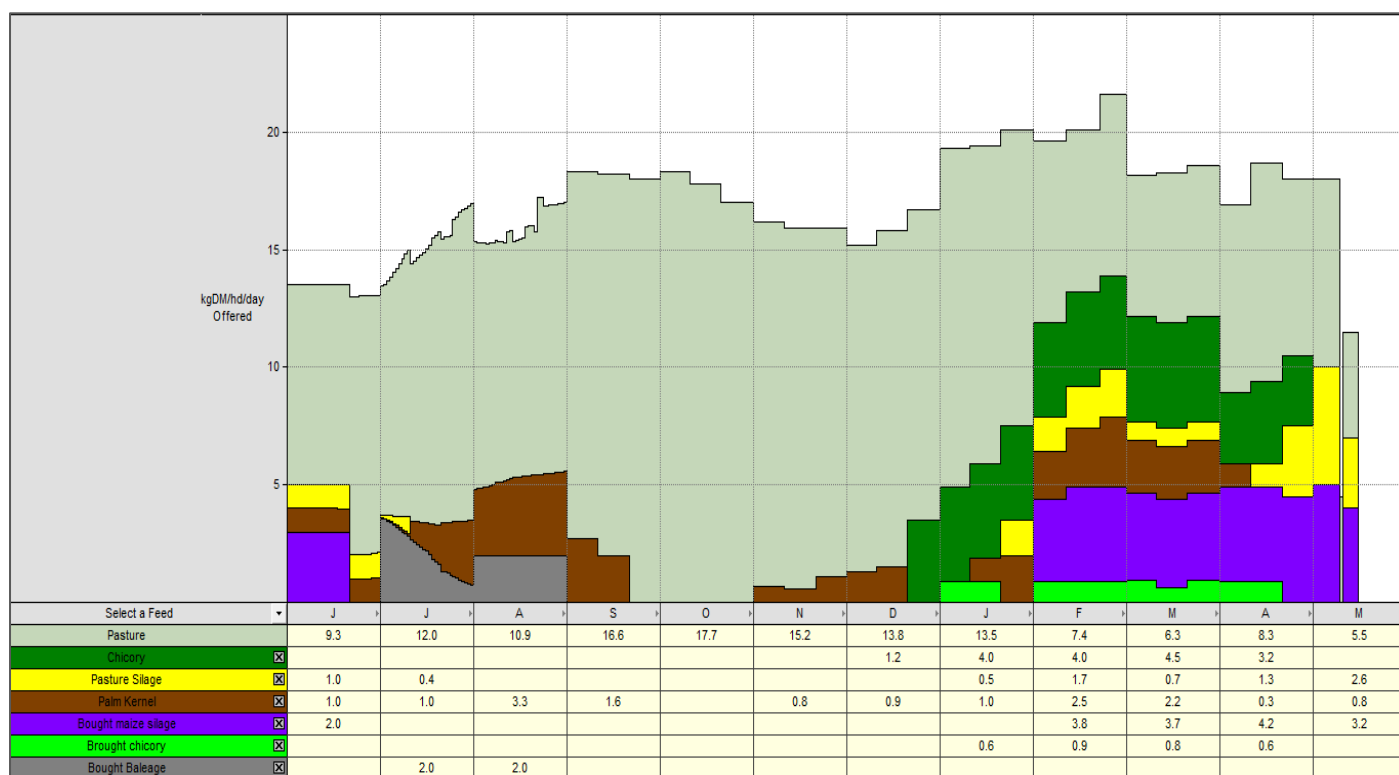


# SEASONAL FEED BUDGET

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



Supplementary feed use throughout the 2016-2017 season



NOTES





## **Next Farm Focus Day**

Wednesday 21 March, 2018

## **Weekly Monitor Walk**

Tuesdays, 11am



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Follow us on Twitter  
[twitter.com/OwlFarmNZ](https://twitter.com/OwlFarmNZ)

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