SIDDC
South Island Dairying Development Centre

**Thursday 15th October 2020**

**10.15 am - 1.00 pm**

# LUDF Focus Day

## *Topics to be covered:*

- Update on LUDF 2020/21 Season to Date.
- Spring feeding, peak milk production. Update on mating program and calf program.
- Pasture monitoring and feed budgeting tools. Showing casing great on line tools to manage pasture and your feed budgets.
- Nitrogen cap. What does the 190 kgN/Ha N-Cap legislation mean for our dairy industry. How do we interpret and comply with the rules.
- LUDF – the journey to low nitrogen use. Real numbers, good science and management principals to minimise the impact of cutting back nitrogen use on your farm while maintaining profitability.

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**Lunch Sponsored by:**

ravensdown

**Venue: LUDF farm, SN 37581**

**Parking on Ellesmere Junction road**

Enquiries: Ph: 03 423 0022 Email: office@siddc.org.nz

Visit the website: **www.siddc.org.nz** for weekly updates on Farm Walk Notes

SIDDC South Island Dairying Development Centre

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**Farming with a Nitrogen Cap**

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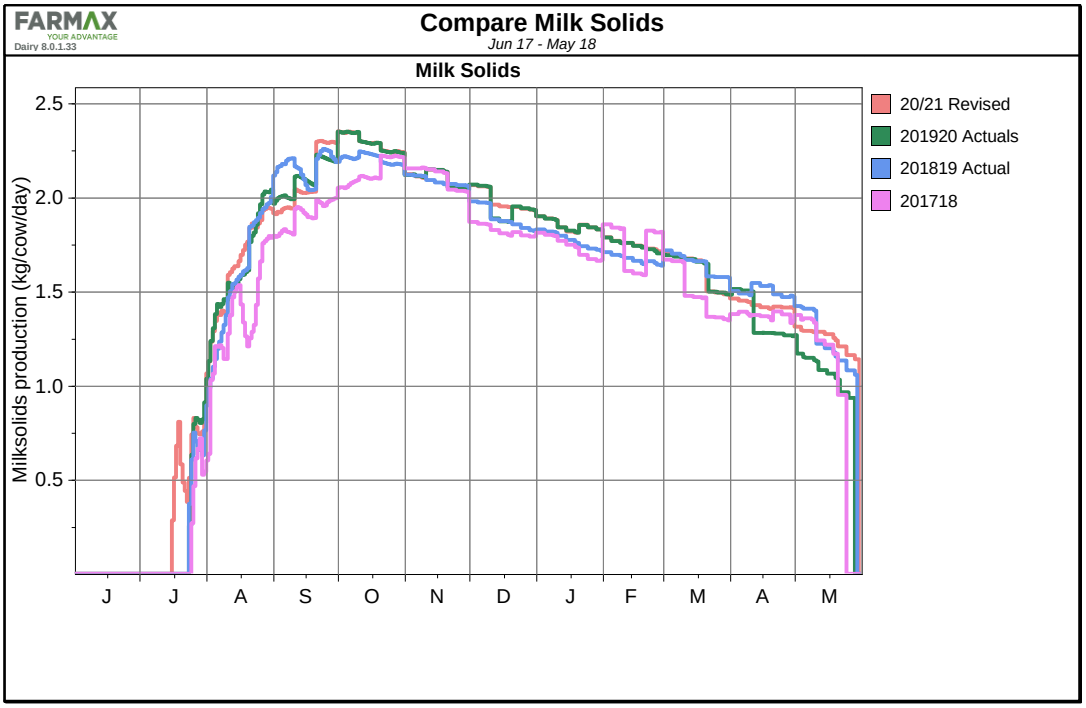
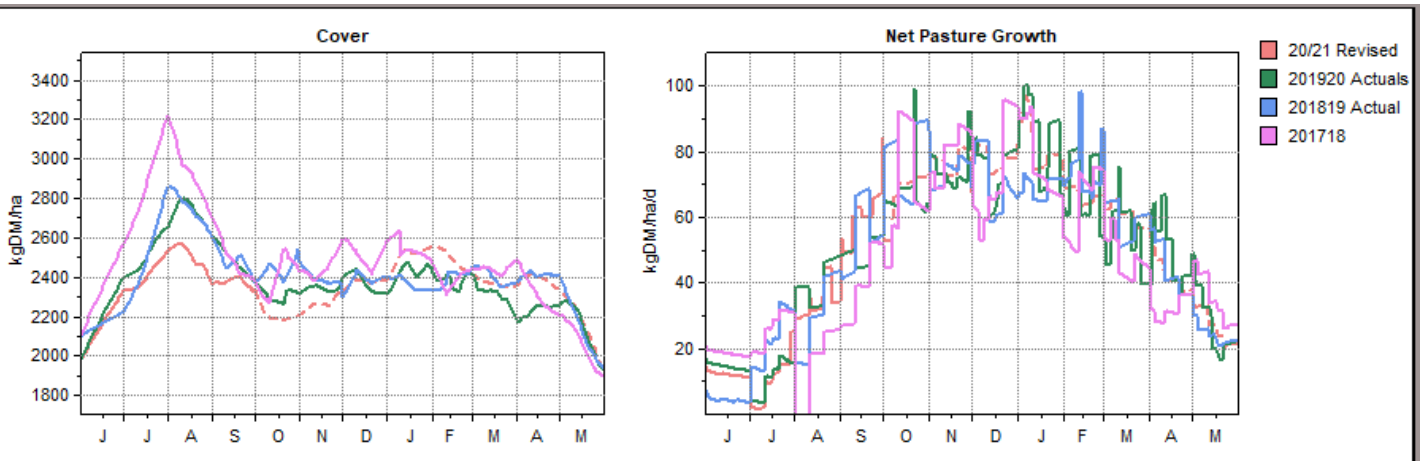
# LUDF Spring 2020 Update

## Pasture, Feeding & Milk Production

- Really well managed spring feed budget – yet again.
- 1st Round finished approx. 12th Sept. Cover was a bit tight but farm grew well with average cover of 2,300+ kgDM/Ha plus maintained through September.
- Used 2 kgDM of silage to milkers – was poorer quality. Cows lifted when finished. 2nd round grass quality was better and also helped lift cows.
- Nitro/Progibb from 7th Sept for several spreads boosted growth.




| | | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cover** (kg DM/ha) | 20/21 Revised | 2,331 | 2,533 | 2,366 | 2,340 | 2,209 | 2,338 | 2,389 | 2,562 | 2,415 | 2,355 | 2,334 | 1,931 |
| | 201920 Actuals | *2,400* | *2,650* | *2,608* | *2,374* | *2,318* | *2,400* | *2,319* | *2,438* | *2,403* | *2,170* | *2,273* | *1,919* |
| | 201819 Actual | 2,223 | 2,856 | 2,611 | 2,372 | 2,477 | 2,300 | 2,400 | 2,330 | 2,455 | 2,373 | 2,404 | 1,941 |
| | 201718 | 2,570 | 3,220 | 2,706 | 2,382 | 2,433 | 2,595 | 2,585 | 2,482 | 2,440 | 2,490 | 2,208 | 1,894 |
| **Net Pasture Growth** (kg DM/ha/d) | 20/21 Revised | 12.1 | 10.3 | 33.9 | 60.2 | 67.1 | 76.7 | 77.6 | 82.3 | 66.7 | 60.5 | 42.5 | 26.5 |
| | 201920 Actuals | *14.3* | *11.0* | *39.8* | *49.3* | *67.6* | *75.0* | *74.7* | *84.7* | *69.0* | *53.6* | *50.0* | *26.1* |
| | 201819 Actual | 4.2 | 23.2 | 29.8 | 54.5 | 79.2 | 73.5 | 70.5 | 69.2 | 74.0 | 59.1 | 43.8 | 23.9 |
| | 201718 | 18.4 | 25.9 | 11.6 | 39.3 | 68.2 | 79.8 | 73.0 | 76.0 | 65.4 | 47.7 | 32.1 | 34.5 |
| **Demand** (kg DM/ha/d) | 20/21 Revised | 0.4 | 3.5 | 38.9 | 58.4 | 63.9 | 61.6 | 64.5 | 65.2 | 61.1 | 56.8 | 43.5 | 40.1 |
| | 201920 Actuals | *0.3* | *2.7* | *38.3* | *57.1* | *64.6* | *61.4* | *65.7* | *69.1* | *64.7* | *56.7* | *46.2* | *35.3* |
| | 201819 Actual | 0.2 | 2.9 | 35.2 | 55.7 | 66.4 | 65.6 | 57.2 | 61.0 | 60.4 | 55.4 | 49.0 | 36.4 |
| | 201718 | 3.4 | 5.8 | 27.8 | 50.7 | 62.9 | 62.7 | 62.8 | 63.8 | 62.7 | 52.7 | 49.6 | 37.9 |

## October Feed Budget & Grazing Rules:

- 555 cows on 162 Ha = 3.43 cows/HA
- @ 2.25 kgMS/cow. Demand = 20 kgDM/cow (Feed quality high @ 12.6 MJME)
- Residual = 1,600 kgDM/HA for high performing cows.
- Demand = 68 kgDM/HA.
- Pasture required = demand X round length.
- Fastest Round = 21 days = 1,430 + 1,600 = 3,030 pregrazing (if less silage used)
- Longest Round = 25 days = 1,700 + 1,600 = 3,300 pregrazing (any more silage mown)

## Calf Sales.

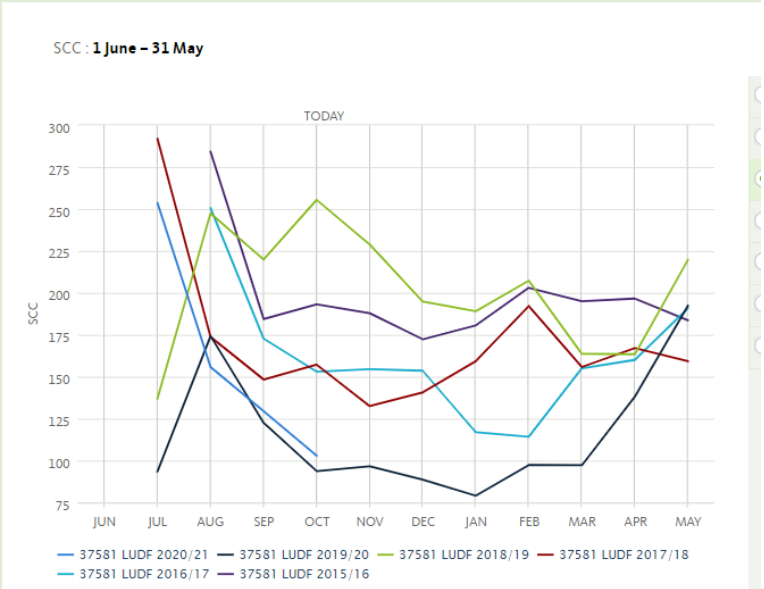
- 116 beef calves @ $80 / hd. Positive feed back from Craigmore and wish to do again next year.
- 37 AB Dairy calves sold.
- Retained 169 calves for replacements. Already weaned 56 calves.
- 321 calves reared.
- Only 3 pellets of milk power used this season. Significant savings.

## Fertiliser

- Significant stripping on north block with the effluent (only 30 Ha spread).
- Full round of Ammo on. Now on 55 kg/HA.
- Will use/trial fert truck with NIR camera's. Will spread 55 kgmax = 25 kgN and cut down to zero on the heavy areas for a start. Then lift as the pastures even up.

## Animal Health

- Cell count tracking at very low levels.
- Staph cows culled out at the close of 2018/19 season.
- 2nd year with no Staph cows.
- SCC significantly lower.
- Less penicillin required.
- No cows being quarantined.



## Mating Prep.

- Heifers too far away for AB this season. 1 hour 20 drive.
- Cow condition on track.
- Mating program similar to last year, with a bit more sexed semen.
- Continue with angus beef and sell offspring Craigmore.
- Intervention, premating heats, will PG anestrus cows after a scan and CL present.

PSM: 18th October 555 numbered animals

| | | | |
|---|---|---|---|
| Week 1 | 20% SGL Angus | 30% A2 Liquid Kiwi X 18 Oct – 22nd Nov | 50% Sexed A2 Kiwi X 18th Oct – 7th Nov |
| Week 2 | Low BW Cows | High BW cows | Highest BW cows 252 cows on plan |
| Week 3 | 310 straws total | 180 cows on plan | 12 straws/day week 1-3 |
| Week 4 | | | 6 straws/day week 4 |
| Week 5 | 70% SGL Angus | 30% A2 Liquid Kiwi X | |
| Week 6 | 100% SGL Angus | | |
| Week 7 | 100% SGL Angus | | |
| Week 8 | SGL Dairy 6th Dec - 2nd Jan | | |
| Week 9 | 200 Cows on plan | | |
| Week 10 | | | |
| Week 11 | | | |

Frozen semen:

- 310 x SGL Angus
- 29 x SGL Dairy (From private storage)

## Staff

- Fully staffed.
- One staff member taking 8 weeks off for AB. Will replace with casual in meantime.
- Staff spring roster 8+2, 8+3.
- Peter Still has a flexable/covering roster.

## Finances

- Budget was 275,000 kgMS @ $3.95 farm operating costs per kgMS.
- Farm operates finance on calendar year, we convert to the farm season.
- Demonstration costs include extraordinary costs not on a commercial farm, eg, lysimeter testing.

## Notes from Season to date:

- Animal health higher with drycow in June (budgeted May).
- We lost a number of animals to acorn poisoning on farm and replaced them with LUDF calves that had been sold (we brought them back).
- R&M high. Cowshed yard required repairs of $20K. Earth quake damage. Will put in a claim for insurance.
- Net costs (backing out demonstration and livestock purchases) are current $0.07 /kgMS over budget.

| LUDF | | 2020/21 Season | | | |
|---|---|---|---|---|---|
| Variance Report | | August | | | |
| Account | Code | Actual FY 2020 August | Budget | Variance to Budget $ | Comments |
| **REVENUE** | | | | | |
| Fonterra Dividend Income | 1302 | 4,541 | 0 | 4,541 | |
| Sales - Bobby Calves | 1821 | 2,315 | 2,600 | (285) | |
| Sales - R2 Heifers | 1823 | 0 | 0 | 0 | |
| Sales - Cows | 1825 | 10,198 | 0 | 10,198 | |
| Sales - Bulls | 1831 | 0 | 0 | 0 | |
| Sales - Other Livestock | 1822,1824,1 | 0 | 6,600 | (6,600) | |
| Sales - Milk Solids Current Seas | 1911 | 3,068 | 2,135 | 934 | |
| Payments Milk Solids Prev Seas | 1912 | 306,621 | 177,093 | 129,529 | Accurual Vs Cash |
| Income - Rent | 1971 | 774 | 4,554 | (3,780) | |
| Income - Other | Various | (375) | 0 | (375) | |
| **TOTAL REVENUE** | | 327,143 | 192,981 | 134,162 | |
| | | | | | |
| | | | 0 | | |
| **EXPENSES** | | | 0 | | |
| Salary Costs | | 0 | 0 | | |
| Farm Salaries Perm & F/Term | 2041-2043 | 66,686 | 64,000 | (2,686) | |
| Farm Casuals | 2046 | 913 | 0 | (913) | |
| Allowances | 2061 | 16,238 | 16,551 | 313 | |
| Superan,ACC,Incr Provison | 2044,2062-2 | 2,001 | 3,060 | 1,059 | |
| **Total Farm Salary Costs** | | 85,837 | 83,611 | (2,226) | |
| | | 0 | 0 | | |
| Operating Expenses | | 0 | 0 | | |
| Appointment Expenses | 2081 | 1,206 | 0 | (1,206) | |
| H&S/Prot Clothing/BioSecurity | 2085 | 279 | 1,000 | 721 | |
| Staff Development | 2095 | 0 | 2,500 | 2,500 | |
| Livestock Purchases | 2111 | 26,250 | 0 | (26,250) | Purchased Heifers to replace acorn issues. |
| Animal Health | 2201 | 14,807 | 4,497 | (10,310) | June spend very high -drycows. |
| Breeding | 2241 | 4,781 | 3,000 | (1,781) | |
| Feed & Grazing | 2271 | 140,769 | 133,629 | (7,140) | Had to purchase feed this spring. |
| Crops/Pastures | 2301 | 0 | 0 | 0 | |
| Seed | 2311 | 167 | 0 | (167) | |
| Fertilisers | 2331 | 0 | 0 | 0 | |
| Weed & Pest Control | 2351 | 0 | 0 | 0 | |
| Contractors | 2361 | 2,632 | 1,500 | (1,132) | |
| Electricity | 2401 | 7,934 | 7,276 | (658) | |
| Freight | 2411 | 10,241 | 15,000 | 4,760 | |
| Vehicle Expenses | 2421 | 3,806 | 4,500 | 694 | |
| R&M (except Farm Houses) | 2441 * | 41,378 | 19,000 | (22,378) | Yard repairs due to earth quake $20K? |
| R & M (Farm Houses) | 2442 | 0 | 300 | 300 | |
| Dairy Shed Operating Expenses | 2461 | 2,016 | 3,677 | 1,661 | |
| Administration | 2601 | 8,495 | 6,250 | (2,245) | |
| Fixed Charges | 2651 | 8,495 | 5,400 | (3,095) | |
| Livestock Decreases | 2911 | 2,746 | 0 | (2,746) | |
| Feed Decrease (Increase) Stock | 2912 | (1,286) | 0 | 1,286 | |
| Demonstration Expenditure | | 28,618 | 17,500 | (11,118) | Need to confirm |
| Other Expenses | Various | 0 | 0 | 0 | |
| **Total Farm Operating Costs** | | 303,333 | 225,030 | (78,303) | |
| | | 0 | 0 | | |
| **CONTRIBUTION MARGIN PROFIT (LOSS)** | | (62,027) | (115,659) | 53,633 | |
| | | 0 | 0 | | |
| Milk Production KgMs | M1911 | 0 | 18,248 | 18,248 | |

September 2020

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# Using Nitrogen Fertiliser on Dairy Farms under a 190kg N/ha cap

## Historical context

Studies in the 1970s and 1980s found that even well-managed ryegrass/white-clover pastures in New Zealand were nitrogen (N) deficient. Tactical use of N fertiliser from early spring to late autumn showed that good pasture responses were achievable, but care must be taken to avoid long-lasting shading of clover plants so that their ability to fix atmospheric N was not compromised.

From the 1990s, year on year increases in N fertiliser use indicated a move away from the reliance on clover N fixation to provide N for pasture growth. Particularly in irrigated dairying, N fertilised pasture was easier to manage because its growth was more predictable than clover-based pasture, with less yearly variation.

It is nearly always cost effective to apply N fertiliser during good growth conditions if the additional pasture can be efficiently used to produce milk. However, higher N applications driving increased pasture yields increases animal N (mainly as protein) intake per hectare. Any protein which is surplus to animal requirements for body growth, maintenance and production is excreted as urinary nitrogen. This decreases the efficiency of fertiliser N use, increases the farm's N surplus and the risk of nitrogen loss to the environment.

## Efficiency considerations

When determining the efficiency of N fertiliser application, consider the following indicators:

1. Farm N surplus or surplus of purchased N (i.e., Fertiliser N + Supplement N – N in meat, milk, crops sold): Efficiency gains are possible whenever the surplus of purchased N is relatively high.

   (**Note:** *Overseer's N surplus includes N inputs from biological fixation and irrigation water and is therefore higher than the surplus of purchased N.*)

2. Amount (kgs) of milk solids (MS) produced/kg N fertiliser: When production is <6kg MS/kg N fertiliser, a reduction in total N fertiliser applied is likely to be profitable.

## Optimising nitrogen fertiliser use

- Ideally pasture height needs to be above 3.5cm (~1500kg DM/ha) before applying N fertiliser.
- Fertiliser N can be applied up to 4 days prior to grazing (i.e., ahead of the cows) without incurring a response penalty in the following regrowth period.
- Grazing from four to 14 days after application is associated with higher N excretion in urine and, therefore, higher risk of N loss to the environment.
- In spring, it takes 25-30 days after application to optimise DM yield before the first grazing*.
- For silage and hay crops, allow the pasture to respond for up to 40-50 days to maximise yield and minimize post-harvest depression of regrowth.
- In autumn, it may take up to 30-40 (autumn) days after application to optimise DM yield before the first grazing.
- At low soil temperatures (<6°C) pasture growth is limited and responses will be slow and limited.
- At high soil temperatures (>16°C) pasture growth and nitrogen response will also be limited.
- Grazing should take place at the 2.5 to three-leaf stage of perennial ryegrass to ensure pasture quality is maintained and high growth rates are utilised. However, prolonged shading of the plant base should be avoided because it will reduce clover branching and grass tillering.

***Note:** Irrigated ryegrass dominant pastures (e.g., Canterbury) may need to be grazed between 20-25 days at peak spring growth rates

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Innovation and Strategy Group

# Using Nitrogen Fertiliser on Dairy Farms under a 190kg N/ha cap

### How to reduce N fertiliser use

- Manage your pastures to maximise clover content and function. Ensure soil fertility is optimal and introduce clover into pastures which have little or none.
- Understanding average annual pasture growth pattern and animal feed demand will identify areas where there is a significant mismatch between supply and demand. This will assist in developing a strategy to fill the deficits i.e., with N fertiliser, supplementary feed or both.
- Monitor feed supply regularly and use a feed wedge to make tactical decisions around timing of N application.
- Utilise farm dairy effluent on as large an area of the farm as possible.
- For the first (late winter/early spring) and last (autumn) N application, consider co-applying N fertiliser (liquid or solid) at half the normal rate with gibberellic acid (sprayed on).
- Apply up to a maximum of 50kg N/ha, depending on predicted feed deficit and the likely response to the N (i.e., kg DM/kg N). Higher rates of application (e.g., 40-50 kg N/ha) are useful when conditions for pasture growth are optimal and pasture surplus to requirements for grazing is harvested for silage.
- Where multiple N applications are applied through the season (e.g., following each grazing) consider applying 5-10 kg N/ha less (to a minimum of 20 kg N/ha) each application.
- From spring through until autumn, if using urea fertiliser use a urease inhibitor coated product.
- Ensure round length is not faster than the period needed for optimising yield response (e.g., 25-30 days in spring) at the first grazing and that pasture is consistently grazed at the 2.5 to three-leaf stage.

- Skip a few paddocks from routine applications when pasture growth rates are high and silage making is not wanted or needed.
- Skip N applications on paddocks in summer when clover content is high and when high soil temperatures will limit the response.
- Ensure N fertiliser is applied at the right rate to the paddocks targeted. Use spreading equipment which has proof of placement technology.


### Acknowledgement

*Some of the information included in this document has been adapted from a DairyNZ article in Southern Rural Life (19th August 2020).*

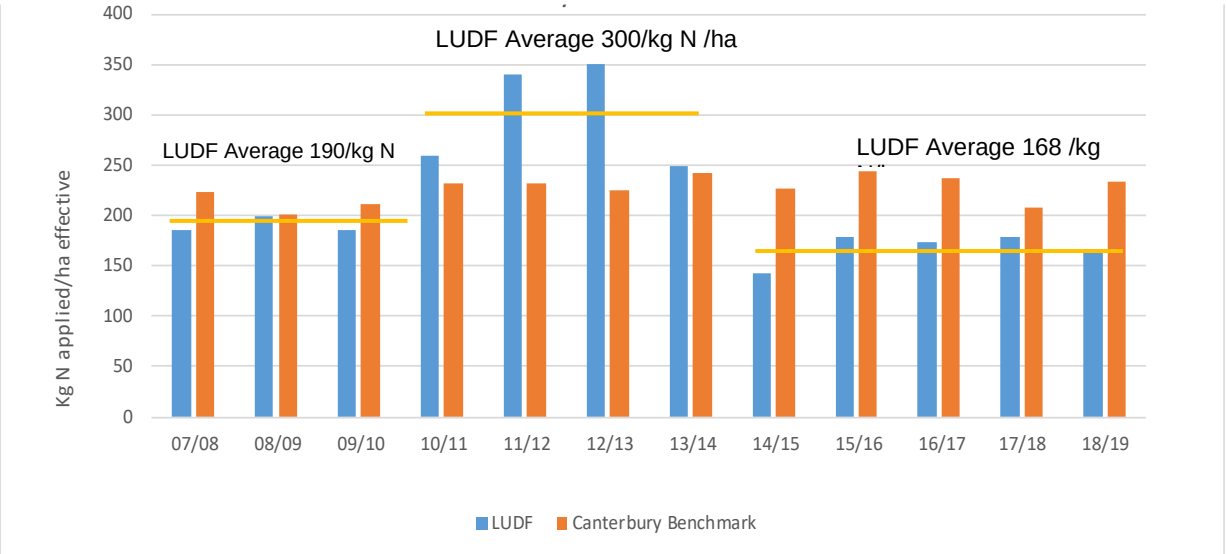
# N fertiliser policy Lincoln University Dairy Farm (LUDF)

*Virginia Serra and David Chapman*

## 1. Nitrogen management

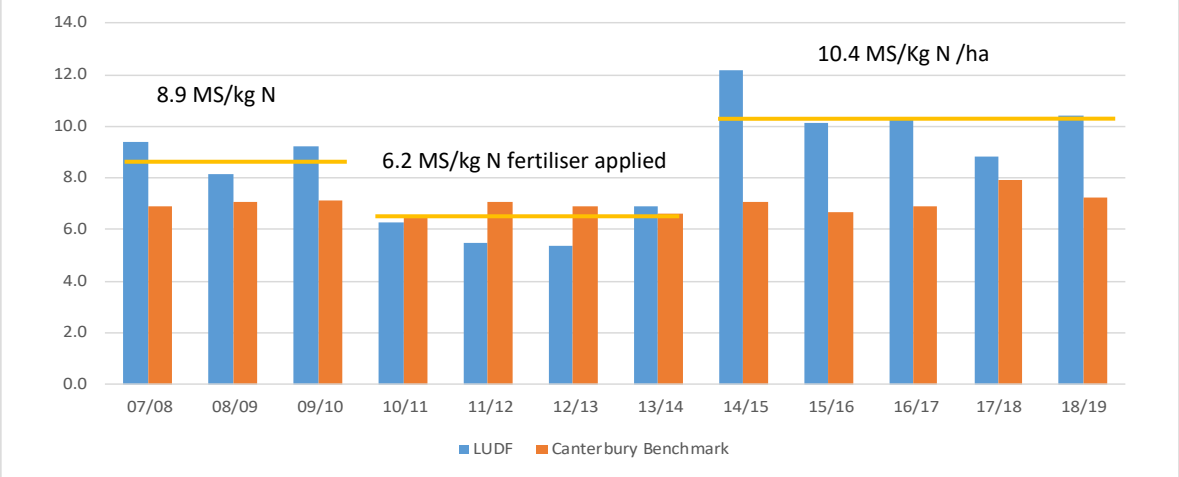
The Lincoln University Dairy Farm had a significant change in the nitrogen (N) use strategy over the last few years. The spread of the clover root weevil in Selwyn in the early 2010s decimated clover on many local farms including LUDF, prompting an increase in N fertiliser use from around 190 kg N/ha between 2003/4 and 2009/10 seasons, to 250 – 350 kg N/ha between 2010/11 and 2013/14 seasons. DCD (Eco-N) was used during this latter period to reduce the risk of N leaching until it was removed from the market in 2013. From the 2014/15 season when the farm implemented the principles from the Pastoral 21 research project, N from fertiliser was reduced to the current N use of around 170 kg N/ha. Graph 1 shows N fertiliser use for LUDF and the average for Canterbury.

***Graph 1: Fertiliser nitrogen (kg N/ha) applied at LUDF and in Canterbury (average from DairyBase)***




Graph 2 presents the N use efficiency (kg MS/kg N fertiliser applied) for LUDF and the average for Canterbury. For LUDF there was a significant increase in N use efficiency (10.4 versus 6.2 kg MS/kg N fertiliser), a remarkable improvement in the overall system efficiency and a key step toward reducing the N footprint of the farm. For Canterbury farms the average milk solids production per kg N applied, for the last 12 years, was 7 kg MS/kg N ranging from 6.5 to 7.9 (source Canterbury- DairyBase).

***Graph 2: kg MS / kg fertiliser N applied at LUDF and in Canterbury (average from DairyBase)***

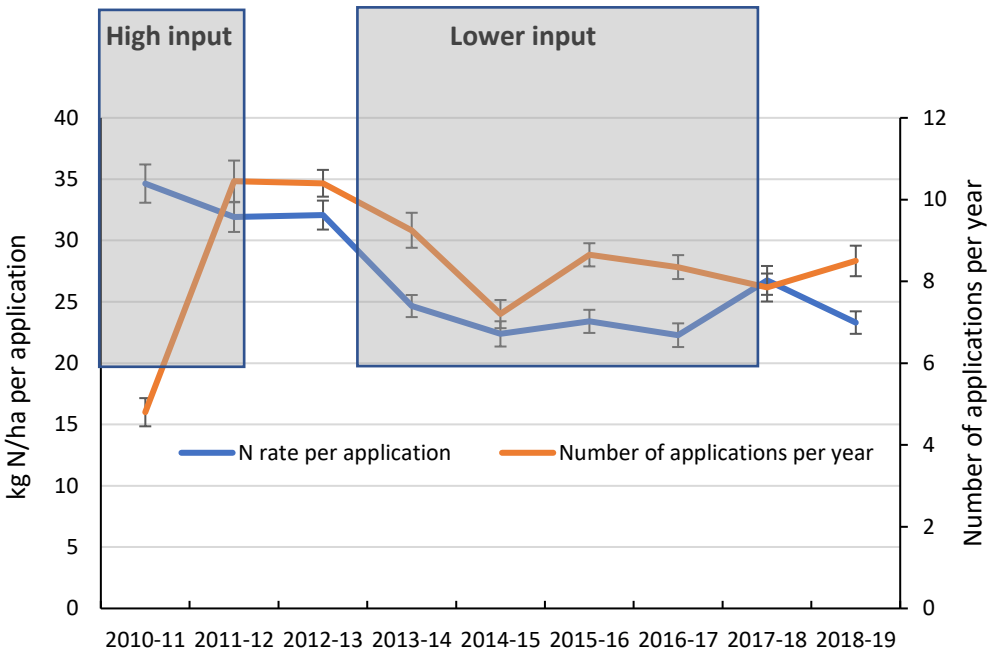



The reduction in N fertiliser was implemented using two main methods:

- Changing the frequency and amount of N applied at each event – contributing to 85% of the overall reduction in N applied
- Markedly reducing N fertiliser applied to the effluent areas – contributing to 15% of the reduction in total N applied

Key features of the change in fertiliser management were: 2.4 fewer applications per year, and an average of 8 kg N/ha less N applied at each fertiliser spreading event. Graph 3 shows how this worked.

***Graph 3. Average rate of N applied per application, and number of applications per year on non-effluent areas at LUDF***




## 2. Pasture growth

As expected, pasture grown was lower in the 'lower input' years from 2014-15 to 2018-19 compared with the 'high input' years of 2011-12 and 2012-13. The average reduction was 1.5 t DM/ha per year (Table 1), as a result of applying 167 kg N/ha less in the 'lower input' years.

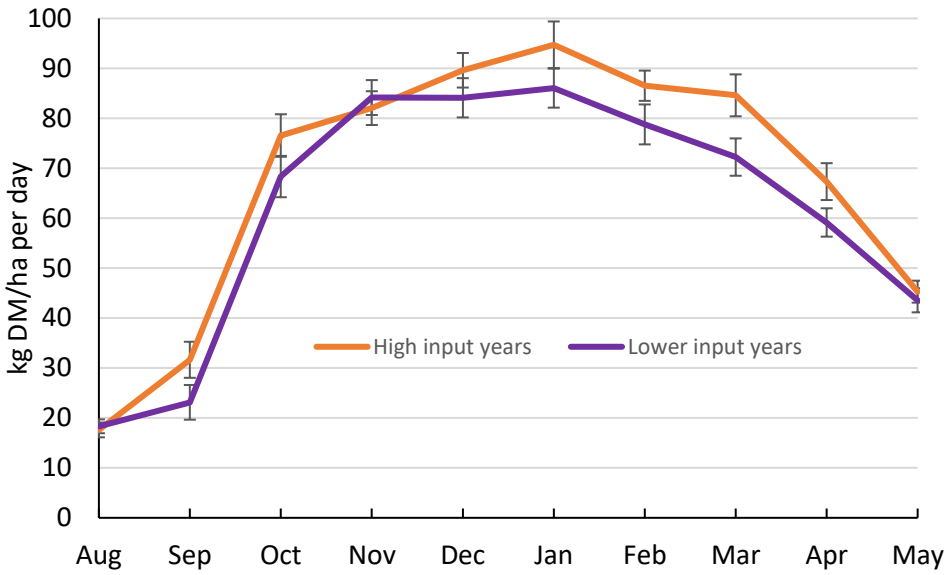
Table 1 suggests the N response efficiency in the LUDF system was about 9.5 kg pasture DM grown per kg N applied.

***Table 1. Comparison of pasture grown at LUDF in the 'high input' and 'lower input' years***

| | High input years | Low input years | Difference |
|---|---|---|---|
| N fertiliser applied (kg N/ha per year) | 325 | 167 | - 158 |
| Pasture grown (t DM/ha per year) | 20.4 | 18.9 | - 1.5 |
| 'Apparent N response efficiency' (kg DM/kg N) | | | 9.5 |

Growth was reduced in most months, as shown in Graph 4.

***Graph 4. Average pasture growth rates at LUDF in the 'high input' and 'lower input' years***

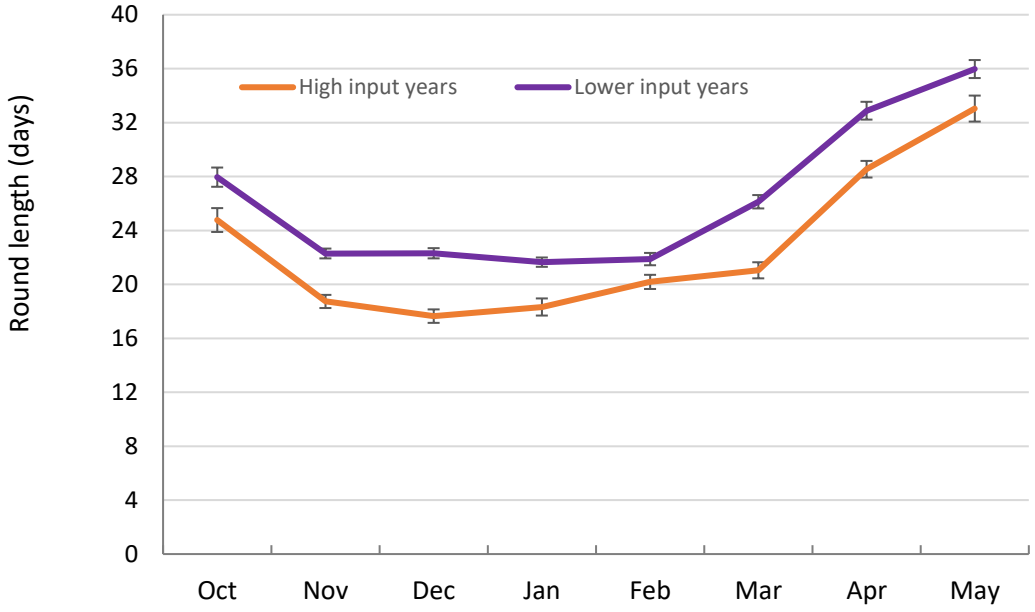



## 3. Grazing management

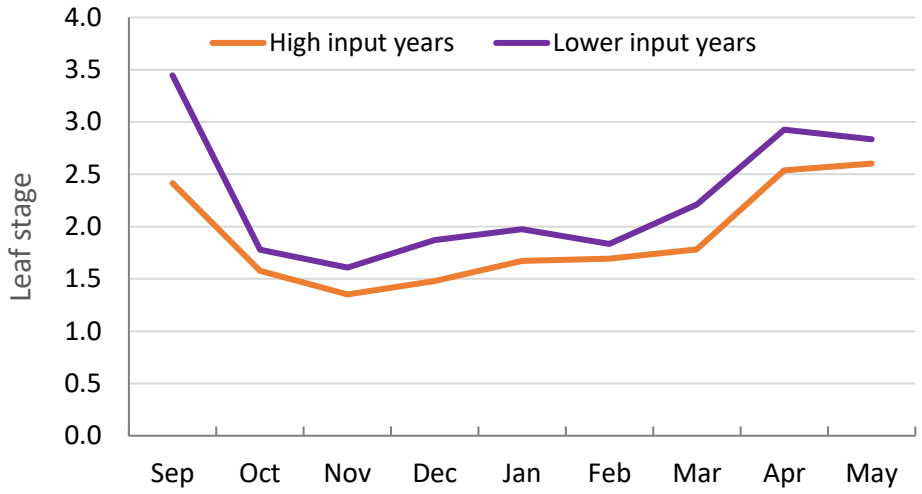
Compared with the 'high input' years, when less N was applied from 2014-15 onwards:

- there were 1.7 fewer grazings per year reflecting a mean 4-day increase in round length (Graph 5)
- The increase in round length resulted in an increase in leaf stage at grazing of ~ 0.4 leaves/grazing (Graph 6), which was estimated to have recouped about 1.1 t DM/ha of the expected reduction in pasture growth resulting from removing N fertiliser.

***Graph 5. Average round length at LUDF in the 'high input' and 'lower input' years***



***Graph 6. Average leaf stage at grazing at LUDF in the 'high input' and 'lower input' years***




Why did round length differ between the 'high input' and 'lower input' years? We are not 100% certain but it is likely a result of the lower growth rates, which meant:

- It takes longer to reach pre-graze pasture cover targets
- Which in turn means that, once the round length is extended, then pre-graze cover targets will creep up in order to sustain that longer round.

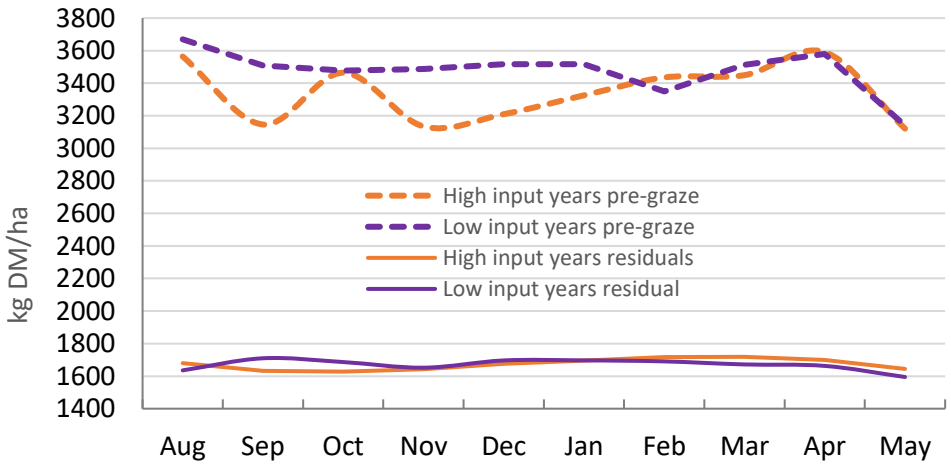
Farmers should anticipate this sequence of events happening if making large reductions in N fertiliser inputs.

Graph 7 shows what the pre- and post-grazing covers looked like at LUDF during the two phases.

Generally-good control of post-graze residuals from high pre-graze covers during the lower input years was assisted by:

- a progression toward tetraploid ryegrass cultivars in pastures (in 2010, about 20% of paddocks contained tetraploids: by 2019, this had increased to 95%); and
- use of pre-graze mowing.

***Graph 7. Average pre- and post-grazing cover at LUDF in the 'high input' and 'lower input' years***




## 4. Pasture quality

Compared with the high N fertiliser years, the average ME of pasture across the full lactation was about 2% lower, and the crude protein content of pasture about 11% lower, in the 'lower input years' (Table 2).

Overall, this would have improved the balance between energy (ME) and nitrogen (crude protein) in the pasture eaten by cows during the lower input years. In turn, this should have reduced the amount of N excreted in urine. But we have no way of confirming this – urinary N wasn't measured, nor is this effect included in Overseer.

***Table 2. Comparison of pasture metabolizable energy (ME) and crude protein in pasture at LUDF in the 'high input' and 'lower input' years***

| | High input years | Low input years | Difference |
|---|---|---|---|
| Metabolisable energy (MJ/kg DM) | 12.2 | 12.0 | - 0.2 (-2%) |
| Crude protein (% DM) | 23.4 | 20.8 | - 2.6 (-11%) |

It is important to mention that clover has returned to the pastures as it was before the clover root weevil outbreak. We expect this would also have 'buffered' the effects of halving N fertiliser inputs, but no information was available on pasture composition to check this.

**5. Summary of key points:**

a) N fertiliser inputs were reduced by an average of 158 kg N/ha per year between the high input and low input years
b) As a result, pasture growth rates were lower in most months and by ~ 1.5 t DM/ha per year annual total
c) Lower growth rates meant it took longer to reach the pre-graze covers required to meet feed requirements, automatically resulting in longer rounds (average 4 days) and higher pre-graze targets. Farmers should anticipate this sequence of events if making large reductions in n fertilsier use.
d) On average there was 1.7 fewer grazings per year during the lower input years, which helped reduce total N inputs (1.7 fewer N applications)
e) Longer rounds/fewer grazings meant led to higher leaf stage at grazing in the lower input years (2.3 versus 1.9) and an estimated 1.1 t more pasture DM grown compared with staying on the same round length/leaf stage that applied during the high N fertiliser input years
f) This 'buffered' the expected large negative effect on pasture production of halving N fertiliser inputs.
g) Higher pre-graze covers under the lower N inputs reduced average ME of pasture by about 2% on average across the whole lactation. This did not appear to restrict milk production.
h) At the same time, crude protein in pastures was 11% lower which, in combination with only a small decrease in ME, should have resulted in less urinary N being excreted by cows in the lower input years.

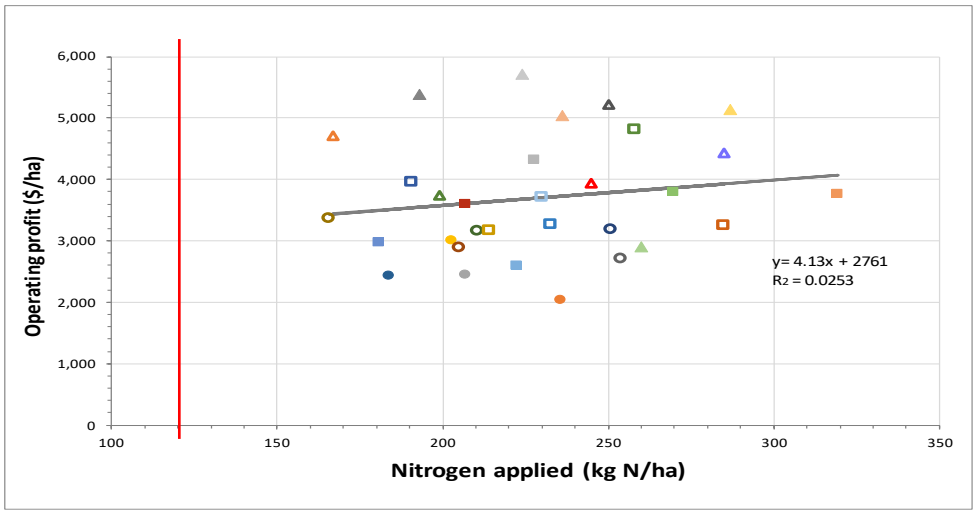
# Farming under a N Fertiliser Cap

Central Government's new freshwater regulations came into law on September 3, 2020, including a cap on synthetic nitrogen fertiliser use. Regional councils are charged with implementing and monitoring the rules. The details on how they plan to do that will become clearer as they work their way through the changes. For more detailed information on all aspects of the regulation visit *www.dairynz.co.nz.*

# Nitrogen use, pasture harvested and profit

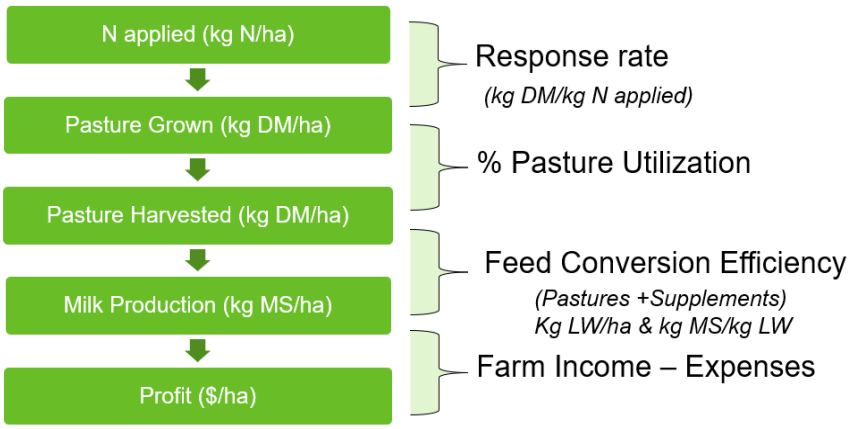
The correlation between nitrogen applied and profit is shown in Graph 8.

*Graph 8: 2018-19 Operating Profit vs N applied (Canterbury Owner Operators -DairyBase)*




Lower N fertiliser use is likely to reduce pasture growth, however how pasture is managed and utilised can minimise the impact on milk production and profit.

*Figure 1: N fertiliser use and profit*




For the same amount of N fertiliser used there are several factors that will influence how much pasture is grown and harvested. Some of these factors are:

- Nitrogen use efficiency affected by timing of N fertiliser, rate of applications and environmental conditions influencing pasture growth (soil temperature, soil moisture, other nutrients etc.)
- Time available for N response (timing between N application and grazing)
- Clover content on the pasture and its management
- Effluent block management
- Factors affecting the release of N in the soil (e.g. cultivation)
- Pasture management and monitoring that can affect pasture utilization

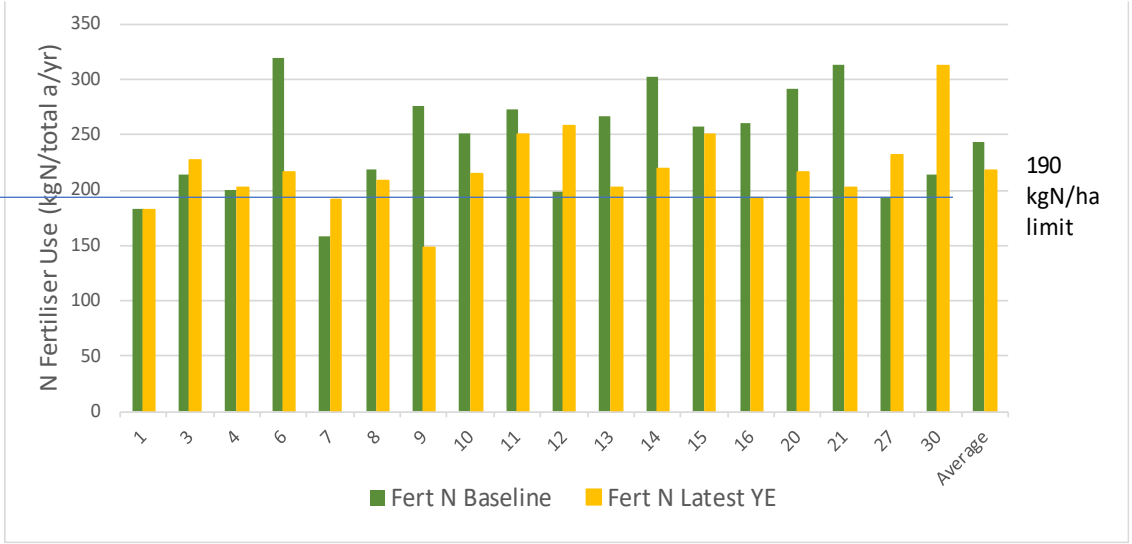
Similarly, how pasture harvested will translate into profit will depend on several factors including:

- How efficient pasture and supplement used are converted to milk production.
- Proportion of feed going into maintenance and milk production
- Cost of nitrogen, feed and overall operating expenses
- Milk price

# Strategies to Reduce N fertiliser use successfully

Graph 9 compares N use in the baseline period (2009-2013) with the latest years available for nineteen of the partner farms involved in the Hinds and Selwyn project. The average N use for the latest year ends available was 218 kg N/ha compared to 244 kg N/ha during the baseline period (11% reduction). Four of these farms had increased N use compared to the baseline period. The year ends (yellow bars) represent the latest year end available for each farm.

Graph 9: Hinds and Selwyn Partner farms- Kg N applied /ha: Baseline Period & Year end.




*Please note that the data from the partner farms presented in this document comes from Overseer which calculates N fertiliser used divided by the total area of the farm and not effective area as it is calculated in DairyBase.*

## Transition to lower N use

**330 – 280 kg N**

Most farms could take this step without major impact

**280 – 230 kg N**

Good planning and management is required

**230 – 190kg N**

Last 40 kg N could be challenging

- Significant reductions (+ 60 kg N/ha) will require time to adapt to new system
- Successful transition better to do in stages rather than in one blow
- Clover needs time to re-establish and be actively fixing N

## Strategies to Reduce N use (Farmers' experiences)

The following recommendations are based on experiences from Canterbury farmers who have reduced N fertiliser rate successfully and without compromising pasture harvested or profit. The farmers have been involved with the Forages for Reduced Nitrate Leaching research programme and the Hinds and Selwyn Project. Many of these strategies are supported directly by science and some are based mainly on farmer experience.

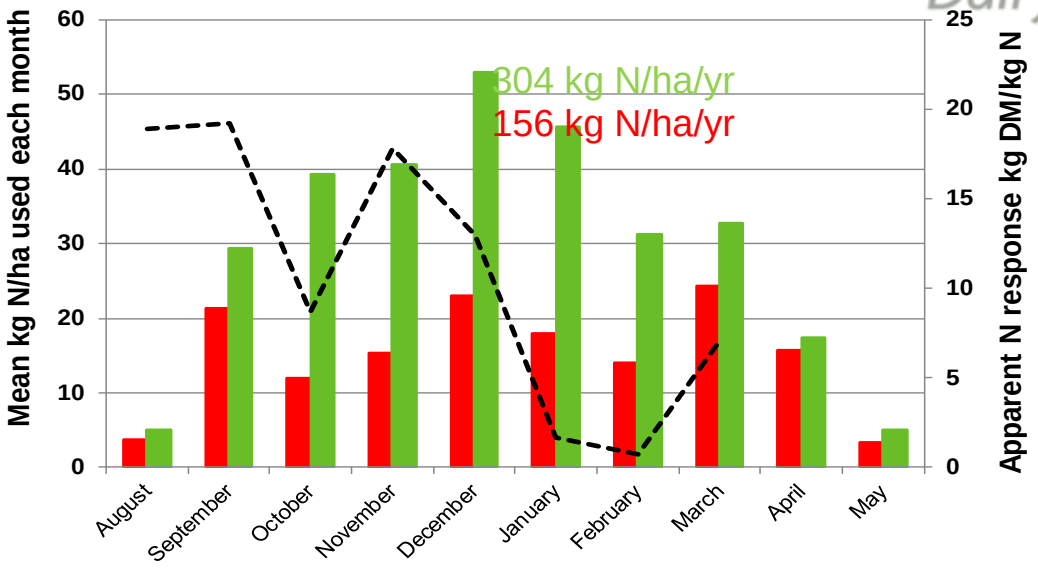
1. **Application rates**

Moving to lower application rates of no more than 40 kg N/ha in early spring and then to 0.8 kg N/ha per day of round length. N applications of 40kg N/ha are most beneficial when filling a genuine feed deficit (e.g. early spring). Mixing with other nutrients can reduce the N rate applied if other nutrients are needed. e.g. mix with Potash, DAP, Sulphate of Ammonia. Costs do increase, however there are advantages to applying nutrients like potassium and sulphate Sulphur in small amounts where there is a risk of these nutrients being lost from the root zone from rain causing drainage.

2. **Timing of Applications**

Not applying N in January/February when soil mineralisation rates are high, and clover is fixing N. Mineral N is available and N is not likely to be the limiting factor for growth. To gain confidence and to check what is limiting pasture growth take herbage samples. One farmer reports pastures looking N deficient, however herbage analysis showed K was deficient, not N. Graph 10 shows that the apparent N response rate to N applied is quite low over the January/February period.

Graph 10: (Pastoral21 Lincoln Farmlet trial N Use)




Red bars: monthly application rates low N system (156 kg N/ha/yr)
Green bars: monthly application rates high N system (304 kg N/ha/yr)
Dotted line: apparent N response (extra kg DM grown / extra kg N applied)

### 3. N fertiliser and pasture management

**Increasing the round length** to ensure grazing at 2½ to 3 leaf stage to grow more grass compared to grazing at 2 leaf or shorter where yield is significantly compromised. In Canterbury this is between 22- 24 days during the spring/summer period (generally from October-February). Where the farm traditionally has been following the cows with N, increasing round length will reduce the total number of grazings per year and 'automatically' will reduce the number of N applications. A longer round length will also reduce the N content in pasture and therefore reduce urinary N excretion.
**Optimizing conditions for clover growth**, ensuring good soil fertility (pH, P, K and Mo) and grazing management to avoid continuous shading of clover. Plan also for good clover establishment when renewing pastures. Clover will fix N and compensate to some extent the lower N from fertiliser.
**Addressing other factors that may be limiting pasture growth** such as, soil fertility, pH, weeds, irrigation, pasture species, drainage etc. Paddock scale soil tests (P, K, S and pH) have been successfully used by several farmers for a more targeted approach to soil nutrients and requirements.
**Pasture walks and "feeding the wedge"** i.e. only applying N if a genuine feed deficit is forecasted. Especially hold back in late autumn when pasture response can be slow and N loss risk is high due to drainage from autumn/winter rain. Any application of N needs to ensure that the extra pasture grown is not lost through increasing residuals or topping.

### 4. Placing of N fertiliser

**Applying less N fertiliser on effluent areas,** targeting times when effluent N is sufficient. If effluent areas are consistently getting effluent, they may only need N fertiliser in early spring and possibly autumn. The N content of effluent can be variable, therefore testing may be required. Applying different amounts of N fertiliser on the effluent area may not be practical where only parts of the paddock get effluent or effluent is not spread on the paddock often.
**Avoiding areas of higher fertility** within paddocks (e.g. first 20-30 meters into a paddock, area around the trough, stock camps) and areas of the farm likely to have low response to N, e.g. dry areas, poorer species. Identify "no go areas" on the spreading map.
**Skipping a few paddocks from routine applications** when pasture growth rates are high and silage making is not wanted/needed. A weekly farm walk and constructing a feed wedge will help with these decisions.

### 5. Special products/technology:

**Coated urea** (N-Protect, SustaiN) reduces volatilisation (the conversion of N in urea to ammonia gas, lost to the air). When using coated urea and conditions for volatilization are present (hot, dry and windy or moist soils in cooler situations) N applied can be reduced by 10% to grow the same amount of pasture than when applying uncoated urea.
**Gibberellic acid (GA)** is a growth hormone found in plants that promotes stem elongation and tiller size but is not a substitute for N fertiliser. When applied with N fertiliser good responses can be expected in early spring and autumn. Many farmers are using GA with N fertiliser specially in the autumn as a way of achieving a higher response to the N fertiliser applied.
**Fertigation** (injection of fertiliser into an irrigation system) and urea applied as a liquid can be used to reduce rates and get even distribution of the N. Fertigation trials have not shown a higher response rate to applying N in a liquid form

compared to N in a solid form (i.e. the form of N does not affect the pasture response). However, if it allows lower application rates and more precise management at an acceptable return on capital, it is a tool that can be used well on farms that are suited to the set up.

### Farmers' lessons of what to avoid:

- Inadequate and/or inaccurate monitoring and recording of N fertiliser applications leading to higher N used than expected at the end of the season.
- Routinely following each grazing with N fertiliser and not responding to a genuine feed deficit. This can be particularly wasteful if on fast grazing rounds.
- Needing N fertiliser to meet a feed deficit generated by following fast grazing rounds. When grazing on fast rounds (< 21 days) pasture is grazed before the 2½ leaf stage (compared to a longer grazing round and grazing at between 2½ and 3 leaf stage) missing out on the period of highest accumulation of growth. This will result in a lower response rate to N fertiliser.
- Using high N fertiliser rates each time that cannot be fully used by plants increasing the risk of the surplus N being lost from the root zone.
- Inadequate pasture monitoring and recording to inform decision making
- The extra N boosted grass grown is poorly utilised, e.g. increase in residuals or excessive pre-graze mowing or topping.
- Harvesting more silage than required due to too high N applications in the previous six weeks.

**For more information https://www.dairynz.co.nz/about-us/regional-projects/selwyn-and-hinds-meeting-a-sustainable-future**

# What are the rules on synthetic nitrogen fertiliser use?

- The amount of synthetic nitrogen fertiliser applied to land **in pastoral land use** will be cap at 190kgN/ha/year from 1 July 2021.
    - The N cap sets the maximum application on any hectare of pasture (area not used to grow annual forage crops).
    - It is possible to put more than 190kg N/ha/year on forage crops but only if offset by applying lower amounts on pasture within the 'contiguous landholding'.
- **Pastoral land use** means the use of land for the grazing of livestock but doesn't include the grazing on the stubble of a crop that has been harvested after arable land use.
- The nitrogen cap applies to a **'contiguous land holding'**. This is 'one or more parcels of land within a farm'. So, if there is a support block contiguous (joined) with the milking platform, it is all subject to the same N-cap. If the run-off is separate, both blocks must separately meet the N-cap.

**Recording and reporting:** All dairy farmers will need to record the tonnages of all synthetic nitrogen fertiliser applied on farm and the area it was applied to. Farmers will then have to report to their regional council on the amount used each year.

**Farmers that exceed the N cap could apply for a resource consent.** Two options are available:

1) Consent for a non-complying activity requiring a **synthetic N reduction plan** that demonstrates how the farm will reduce their use of synthetic N by **1 July 2023**
2) Consent for a non-complying activity requiring the farm to ensure that the rate at which N may enter water as a result of their application of synthetic N fertiliser does not exceed the rate that would enter water if 190kg N/ha/year was applied. This will be granted for a **maximum term of 5 years.**

**Regional councils are still working on the details on how this will be implemented at a regional level.**

## What do I need to do now?

1. **Understand the new regulations** and how they would apply to your farm. Discuss what it means for you with your trusted advisor.
2. **Know how much synthetic N fertiliser was applied last year** over each hectare of the farm. It is important to accurately identify the size of the reduction required.
3. **Have good systems in place for recording** the tonnages and the area it was applied to of all synthetic N fertiliser applied on farm. Ensure all sources of synthetic N are accounted for.
4. **Review your current N use strategy** to identify potential areas to improve N use efficiency.
    a. How much N fertiliser was applied and when? Was the N fertiliser applied to the paddocks/areas of the farm targeted? Some farmers have reported significant discrepancies between planned and actual N use.
    b. How much N fertiliser was applied on the effluent and non-effluent areas?
    c. How many applications, how often and at what rate (kg N/ha/application)?
    d. What type of N fertiliser was used?
    e. Has the N boosted grass been used to fill a genuine feed deficit?

- **Create a plan to meet the 190 kg N/ha cap**. If you are currently using more than 190 kg N/ha of synthetic fertiliser over any area of the farm you need to take some actions now to comply with the new requirements. If a significant reduction is required (>50 kg N/ha), targeting half of the required reduction now (2020/21 season) and the other half next season can help ease into the new system with less N fertiliser used.

# The importance of measuring pasture
Jeremy Savage, *Macfarlane Rural Business*

## DSM (Dairy Systems Monitoring) Data, MRB Clients

| Group (Farmax EBIT) | Low EBIT | Mid EBIT | High EBIT |
|---|---|---|---|
| Stocking rate cows/ha | 2.7 | 3.3 | 3.56 |
| Production kgMS/cow | 407.0 | 469 | 508 |
| Pasture Harvested/ha | 9.5 | 13.3 | 15.2 |
| Pasture Harvested/cow | 3500 | 4030 | 4270 |
| Forage Harvested/cow | 211 | 244 | 182 |
| Supplement/cow | 670 | 726 | 616 |
| Bought feed as % feed eaten | 19% | 18% | 14% |

## Per Cow Production

- Data from 70 farms, benchmarked using Farmax
- MRB average clients produced 469 kgMS/cow.
- Our top clients produced 509 kgMS/cow.
- The supplement use for top farms was the same.
- The bottom farms were drought effected, low Production potential farms.
- Often the average farms and top farms were Neighbouring farms

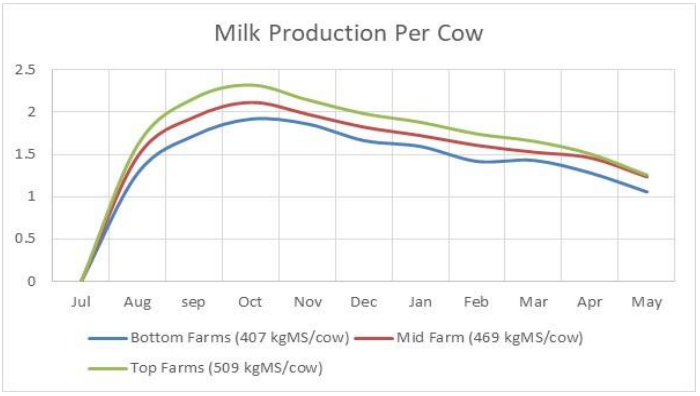



*Figure. Per cow production across MRB Client Base*

## Pasture Management

- The top farms managed pastures very well.
- Top farm covers only varied by +/-50 kgDM/Ha
- Mid farms bounced around +/- 150 kgDM/Ha.
- The peak on mid farms was limited with running short of Pasture in September. This shows up in the milk curve.
- Top farms with better control harvested more grass. This is Achieved with a higher per cow production with A higher demand, utilising pasture well and being Consistent with round length etc as noted in David Chapmans data on LUDF
- Top farms use supplement to manage pasture, and Stay in the right zone. They don't use supplement to get cows To milk better.

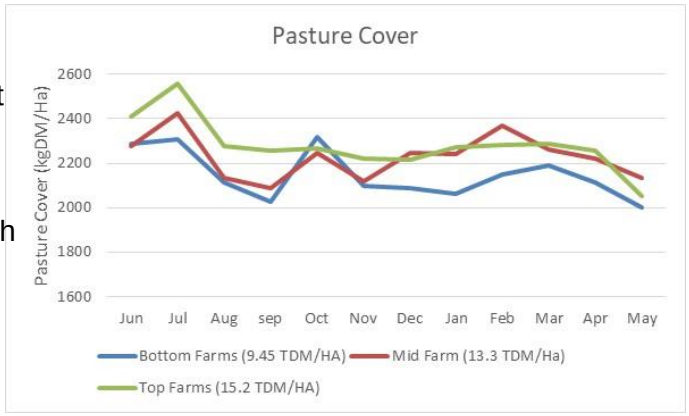
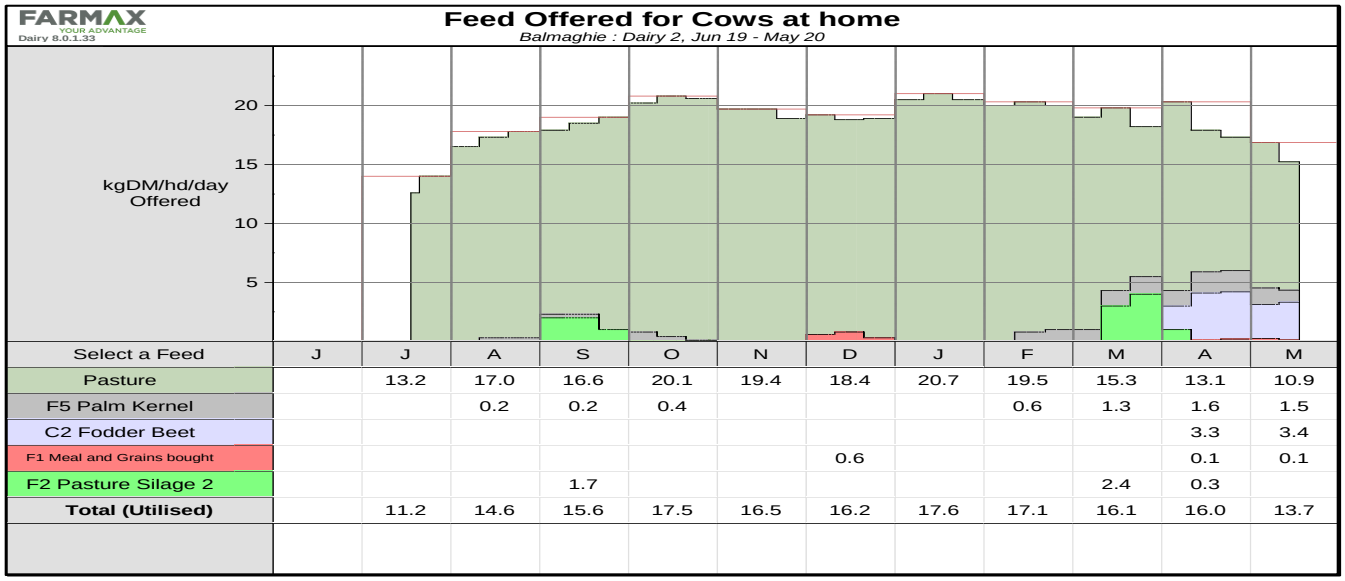



*Figure. Pasture covers of three farm groups.*

**The "Sweet Spot Range" for high performance on pasture:**

- Average cover 2,150 – 2,300 kgDM/Ha to fully feed cows.
- Round length 20 – 24 days to get optimum pasture growth.
- Covers on feed wedge growing to 2,900 – 3,100 kgDM/Ha before grazing.
- The longer length allows for 3rd leaf emergence and longer for pasture at 100% growth.
- Covers over 3,200+ dropped out for silage. (LUDF tetraploids can go upto 3,300 kgDM/Ha). When covers too high, palatability drops and cow intakes drop with high NDF

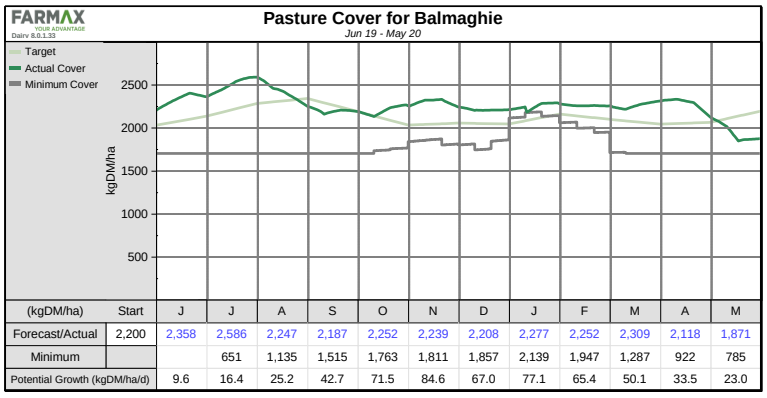
**Using Supplement to Manage Pasture**




| Select a Feed | J | J | A | S | O | N | D | J | F | M | A | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pasture | | 13.2 | 17.0 | 16.6 | 20.1 | 19.4 | 18.4 | 20.7 | 19.5 | 15.3 | 13.1 | 10.9 |
| F5 Palm Kernel | | | 0.2 | 0.2 | 0.4 | | | | 0.6 | 1.3 | 1.6 | 1.5 |
| C2 Fodder Beet | | | | | | | | | | | 3.3 | 3.4 |
| F1 Meal and Grains bought | | | | | | | 0.6 | | | | 0.1 | 0.1 |
| F2 Pasture Silage 2 | | | | 1.7 | | | | | | 2.4 | 0.3 | |
| **Total (Utilised)** | | 11.2 | 14.6 | 15.6 | 17.5 | 16.5 | 16.2 | 17.6 | 17.1 | 16.1 | 16.0 | 13.7 |

**Balmaghie Farm. Ashburton**

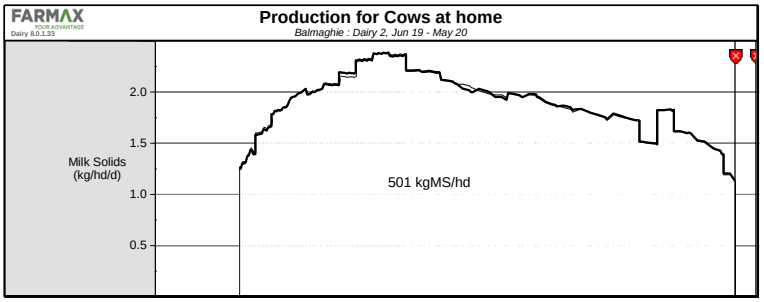
- 684 cow herd, stocking rate 3.4 cows/Ha
- Supplement used to get cows to peak.
- Supplement used to keep cows in the 2,200 – 2,300 kgDM/Ha sweet spot range.
- Supplement all out when there was enough Grass on farm. 42 days in November, 42 days In January.
- No supplement in January did not effect milk.
- Used supplement to keep cows going when Growth dropped (hot dry weather).




| (kgDM/ha) | Start | J | J | A | S | O | N | D | J | F | M | A | M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Forecast/Actual | 2,200 | 2,358 | 2,586 | 2,247 | 2,187 | 2,252 | 2,239 | 2,208 | 2,277 | 2,252 | 2,309 | 2,118 | 1,871 |
| Minimum | | | 651 | 1,135 | 1,515 | 1,763 | 1,811 | 1,857 | 2,139 | 1,947 | 1,287 | 922 | 785 |
| Potential Growth (kgDM/ha/d) | | 9.6 | 16.4 | 25.2 | 42.7 | 71.5 | 84.6 | 67.0 | 77.1 | 65.4 | 50.1 | 33.5 | 23.0 |

Pasture Cover

- Pasture cover monitored weekly.
- Farm manager actively managed feeding to Control cover.
- Season was cut short, serious grass grub damage In autumn pulled of 10 kgMS/cow. Farm recovered for the 2020/21 season from grub.



## Pasture Coach


## Chris Lewis, *B&A, Masterton, Pasture Coach*
www.pasturecoachnz.co.nz


## What does Pasture Coach do?

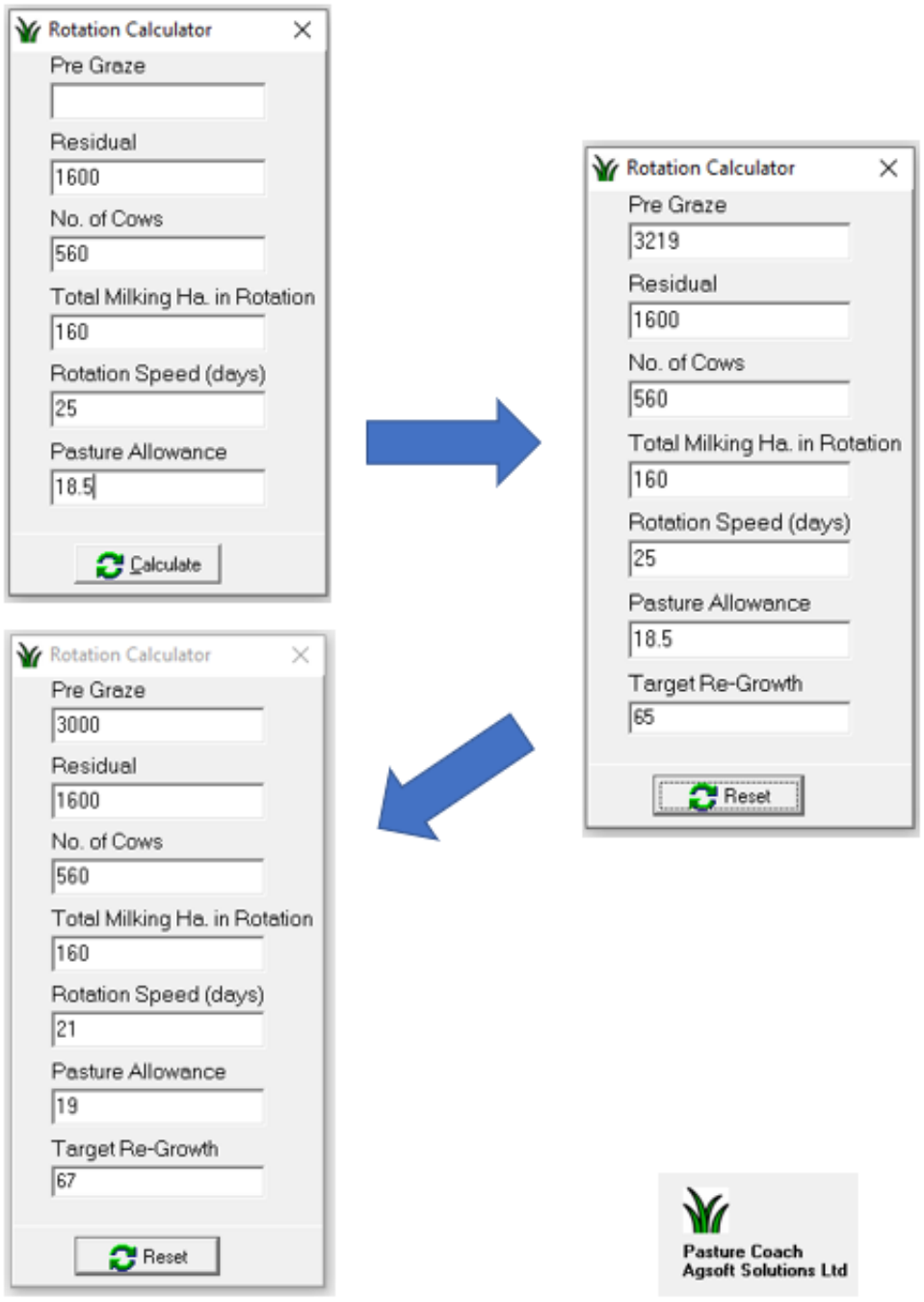
- Just about grass
- Short term decision support
- Feed Wedge is core
- It coaches as a catalyst to early well supported pasture management decisions.

## Three access points

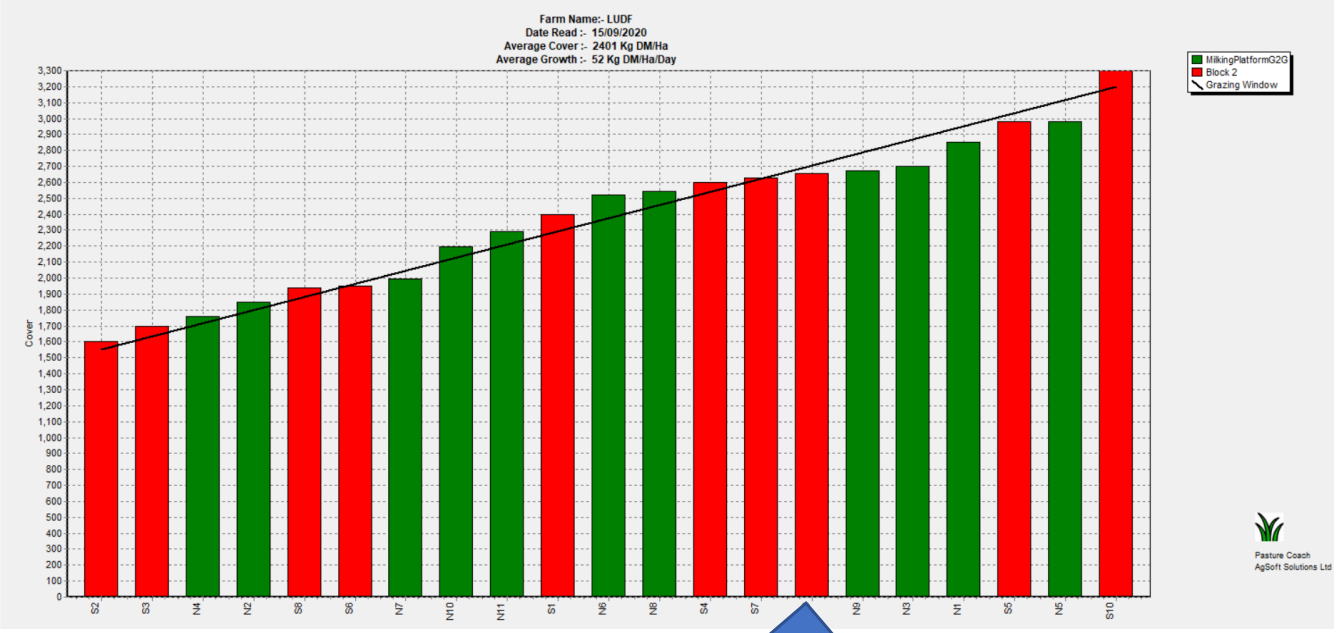
1. PC (Microsoft) – full functionality, data entry, reporting, predict wedge and advanced tools.
2. Smart Phone App – limited functionality, data entry, reporting, simple tools.
3. Website – register, add other users, pay, simple high-level reports.

License: **$175** for twelve months, unlimited users per farm.

**Decision Support – using the rotation calculator.**



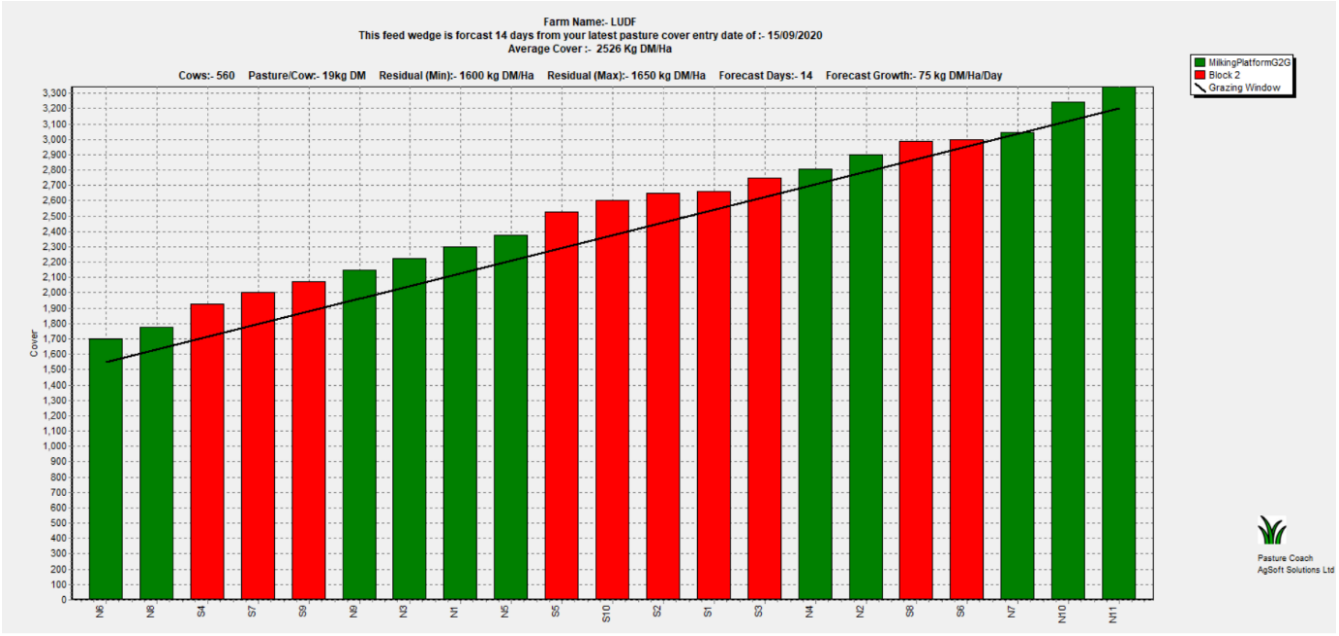
## Decision Support – using the Feed Wedge




Cover = 2401, growth 52


Pasture Coach
Agsoft Solutions Ltd

cover = 2526



## Advanced Decision Support – Conservation and Topping Tool

Conservation and Topping Tool

| | Period 1 | Period 2 | Period 3 | Period 4 |
|---|---|---|---|---|
| No. of Cows | 560 | 560 | 560 | 560 |
| Pasture/Cow | 19 | 19 | 19 | 19 |
| Forecast Grass Growth | 65 | 75 | 80 | 80 |
| Forecast Days | 7 | 7 | 7 | 7 |

Desired Residual (Min): 1500 — Desired Residual (Max): 1650

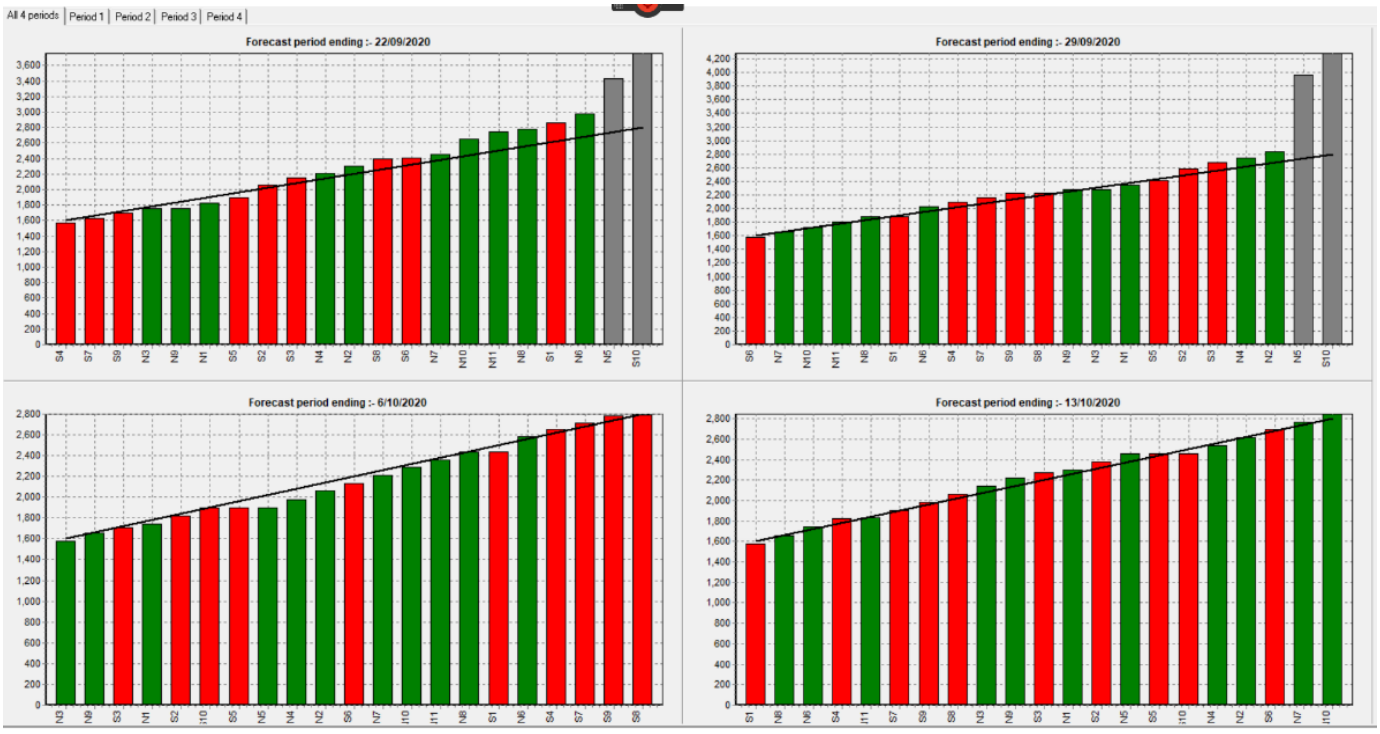
Cut Date: 1/10/2020 — Cut Residual: 1500

Topping Trigger Value: 1500 — Topping Residual: 1500

**Pasture Coach suggests:- 116.5 Ha are needed in the grazed area**
**43.9 Ha (maximum) can be taken out of the rotation**

**Area in rotation:- 142.3578 Ha** **Area shut for conservation:- 18.065 Ha** **Area out for crop/regrass:- 0 Ha**

| Paddock Name | Current Cover | Check to include in rotation | Check to shut for Conservation | Check to shut for crop/regrass |
|---|---|---|---|---|
| S10 | 3300 | ☐ | ☑ | ☐ |
| N5 | 2978 | ☐ | ☑ | ☐ |
| S5 | 2978 | ☑ | ☐ | ☐ |
| N1 | 2850 | ☑ | ☐ | ☐ |
| N3 | 2698 | ☑ | ☐ | ☐ |
| N9 | 2670 | ☑ | ☐ | ☐ |
| S9 | 2656 | ☑ | ☐ | ☐ |
| S7 | 2628 | ☑ | ☐ | ☐ |
| S4 | 2600 | ☑ | ☐ | ☐ |
| N8 | 2542 | ☑ | ☐ | ☐ |



**Decision Support – what does each paddock grow?**

# *Annual Yield by Paddock*

**Farm Name:** LUDF

* Pasture Growth rate records are not complete for these years.

| Paddock Name | Jun 16-May 17 | Jun 17-May 18 | Jun 18-May 19 | Jun 19-May 20 | Jun 20-May 21 |
|---|---|---|---|---|---|
| S4 | 24532 | 22340 | *24839 | *20238 | *3119 |
| S5 | *22316 | 19781 | *24482 | *19521 | *3037 |
| N9 | 24347 | 18892 | *22919 | *19875 | *2765 |
| S2 | 28571 | 21250 | *16453 | *18982 | *2645 |
| N5 | 23307 | 20344 | *20695 | *18993 | *2644 |
| N6 | 21244 | 25034 | *16617 | *18951 | *2633 |
| S9 | 25393 | 20925 | *17360 | *18024 | *2565 |
| N7 | 26958 | 19816 | *18106 | *20212 | *2512 |
| N1 | 23659 | *16994 | *19202 | *19153 | *2458 |
| N3 | 24114 | 21018 | *20047 | *19647 | *2414 |
| S3 | 27659 | 22391 | *21791 | *20132 | *2197 |
| S6 | 24305 | 18034 | *21758 | *14221 | *2181 |
| N10 | 21441 | 18884 | *19335 | *17184 | *2160 |
| S7 | *22010 | 20535 | *24273 | *19311 | *2032 |
| N8 | 24486 | 18864 | *22380 | *18691 | *1985 |
| S10 | 22861 | 15191 | *18496 | *16989 | *1902 |
| S8 | 26069 | 22575 | *17256 | *16876 | *1816 |
| N2 | 21460 | *11822 | *13956 | *15599 | *1808 |
| S1 | 25707 | 19836 | *17817 | *17013 | *1801 |
| N4 | 24259 | 20885 | *21830 | *15836 | *1405 |
| N11 | 20521 | 19553 | *16909 | *18768 | *1329 |
| **Averages:** | **24258** | **20324** | ***0** | ***0** | ***0** |

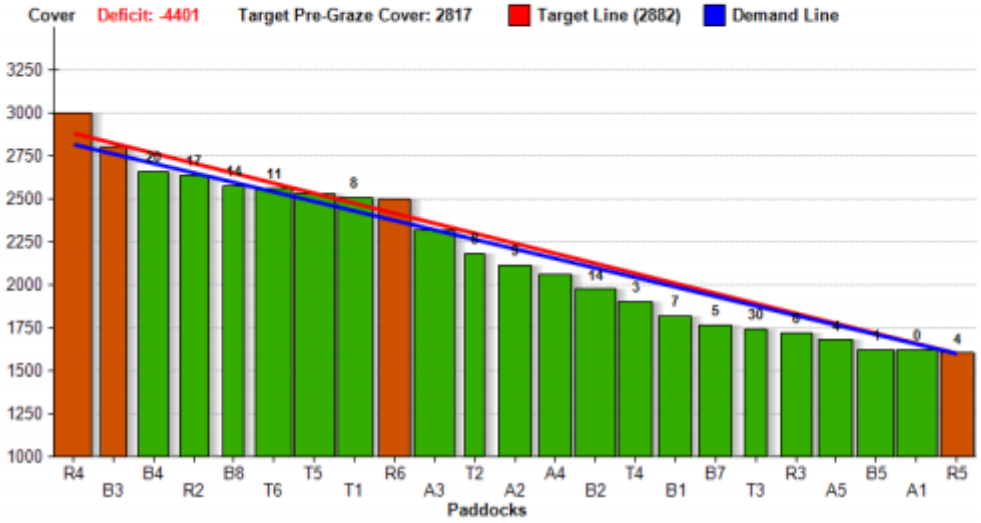
# AgriNet Grass

## Simon Le Heron, *General Manager, Grasslands Ltd*

- On Line web based tool.
- Also available on Android and Apple phones for data entry in the paddock and brief analysis.
- The feed budgeting and scenario planning only on website.
- Enter your farm walk Plus forced to enter when paddocks were grazed and what the residual was. This confirms your growth rates, round length and how paddocks perform.
- Demand and feeding is manually entered. Very simple, but reliable feed budget.
- Calculates your actual round length based on when paddocks are grazed.
- Based in Ireland (Currently $60 euro's), built with input from Adrian Van Bysterveldt.
- Below a 1 page report – great for staff and to leave in the ute to plan and confirm how farm is going.

AgriNet www.agrinet.ie

| | | | | | |
|---|---|---|---|---|---|
| **Farmer** | [redacted] | **Demand / Day** | 6270 | **Rotation Last Week** | 21.9 |
| **Date** | 24/09/2020 | **Demand / Ha** | 55.4 | **Area Unmeasured** | 9.22 Ha |
| **Mob** | All Mobs | **LU / Ha** | 3.09 | **Post Grazing Cover** | 1600 |
| **Daily Growth** | 71 (59.8) | **Cover / LU** | 213.27 | **Litre/Cow/Day** | 16.38 (08/02) |
| **Farm Cover** | 2159 | **Short Term Silage** | 0 (0Ha) | **kgMS/Cow** | 1.51 |
| **Total Area** | 113.26 | **Long Term Silage** | 0 (0Ha) | **Milk Quality** | F5.13% / P3.85% |
| **Total LU** | 350 | **Rotation Length** | 22 | **KgMs/Ha YTD** | 0 (122.48 Ha) |
| **Weather** | 22mm, 0° | | | | |



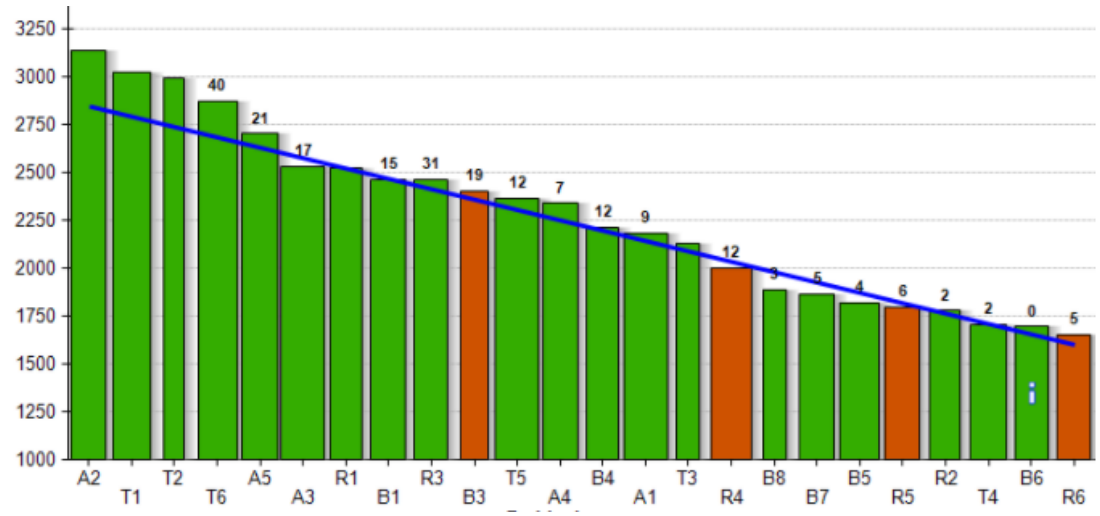

**Decisions:** Spring Cows Quantity: 8 to 330 | Spring Cows Grass: 10 to 19 | Spring Cows Meal: 0 to 1 | Spring Cows Grass Target: 10 to 20 | Autumn Cows Quantity: 0 to 20 | Rotation Length: 20 to 22 |

**Decisions Notes:** From Phone

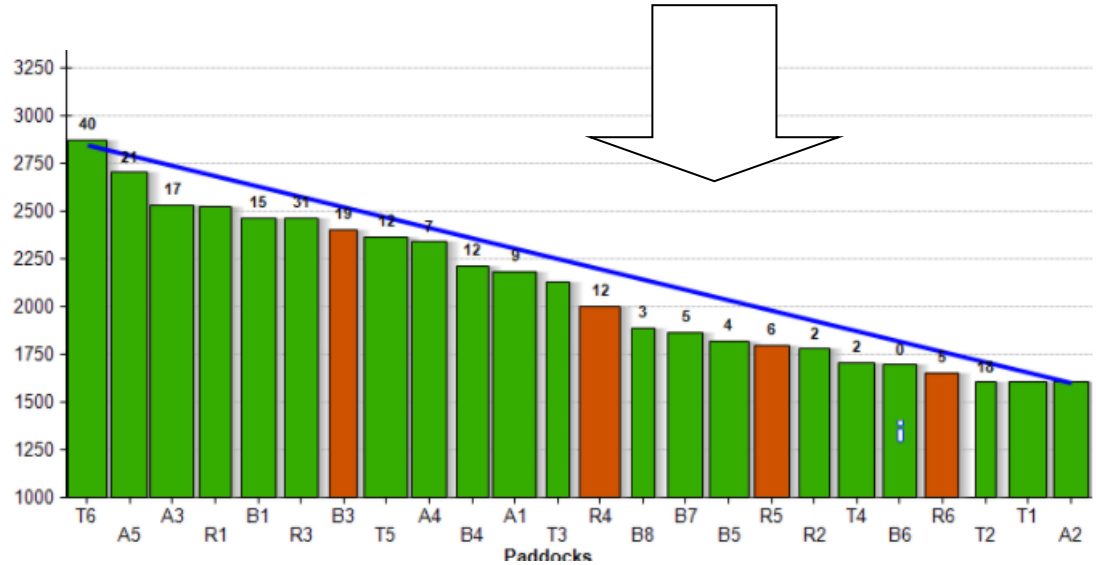
| Code | Name | Area | Cover | Growth | Grow/Day | Feed | Days | Comment | Mob |
|---|---|---|---|---|---|---|---|---|---|
| R4 | | 5.800 | 3000 | 500 | 62.5 | 8120 | 1.3 | | 2 |
| B3 | | 3.900 | 2800 | 400 | 50.0 | 4680 | 0.8 | | 2 |
| B4 | | 4.500 | 2654 | | | 4743 | 0.8 | | 1 |
| R2 | | 4.250 | 2632 | 532 | 66.5 | 4386 | 0.7 | | 1 |
| B8 | | 3.200 | 2572 | 700 | 87.5 | 3110 | 0.5 | | 1 |
| T6 | | 5.500 | 2558 | 896 | 112.0 | 5269 | 0.8 | | 1 |
| T5 | | 6.100 | 2530 | 644 | 80.5 | 5673 | 0.9 | | 1 |
| T1 | | 5.300 | 2502 | 854 | 106.8 | 4781 | 0.8 | | 1 |
| R6 | | 4.800 | 2500 | | | 4320 | 0.7 | | 2 |
| A3 | | 6.200 | 2316 | 542 | 67.8 | 4439 | 0.7 | | 1 |
| T2 | | 2.910 | 2180 | 476 | 59.5 | 1688 | 0.3 | | 1 |
| A2 | | 5.000 | 2110 | 504 | 63.0 | 2550 | 0.4 | | 1 |
| A4 | | 5.000 | 2054 | 434 | 54.3 | 2270 | 0.4 | | 1 |
| B2 | | 6.100 | 1970 | 312 | 39.0 | 2257 | 0.4 | | 1 |
| T4 | | 5.200 | 1900 | 678 | 84.8 | 1560 | 0.3 | | 1 |
| B1 | | 5.000 | 1816 | 192 | 24.0 | 1080 | 0.2 | | 1 |
| B7 | | 4.900 | 1760 | 228 | 28.5 | 784 | 0.1 | | 1 |
| T3 | | 3.310 | 1742 | | | 470 | 0.1 | | 1 |
| R3 | | 4.700 | 1718 | 149 | 18.6 | 555 | 0.1 | | 1 |
| A5 | | 5.100 | 1676 | 168 | 21.0 | 388 | 0.1 | | 1 |
| B5 | | 5.500 | 1620 | 344 | 43.0 | 110 | 0.0 | | 1 |
| A1 | | 6.100 | 1620 | 734 | 91.8 | 122 | 0.0 | | 1 |
| R5 | | 4.890 | 1600 | 200 | 25.0 | 0 | 0.0 | | 2 |

**Reading the graph:**
Blue line = current feeding levels.
Red line = target feeding levels. (eg, removing supplement).
Width of the bar = paddock size.
Numbers on graph = days since grazed.

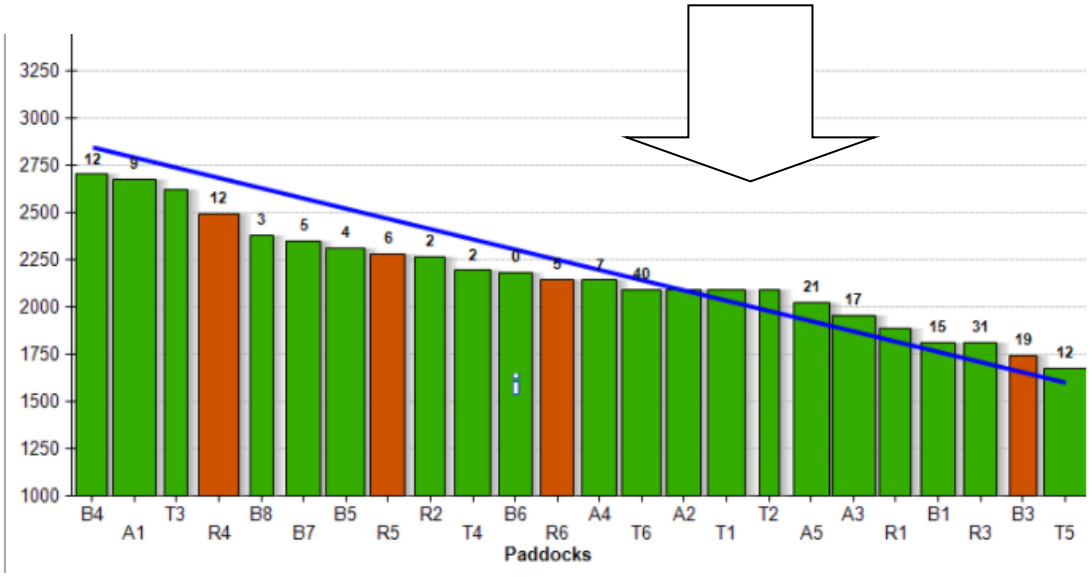
# Silage Decisions:




Can remove paddocks for silage with a click of the button.




Then can confirm your decision based on expected growth – eg, 7 days @ 70 kgDM/day = not a great idea.



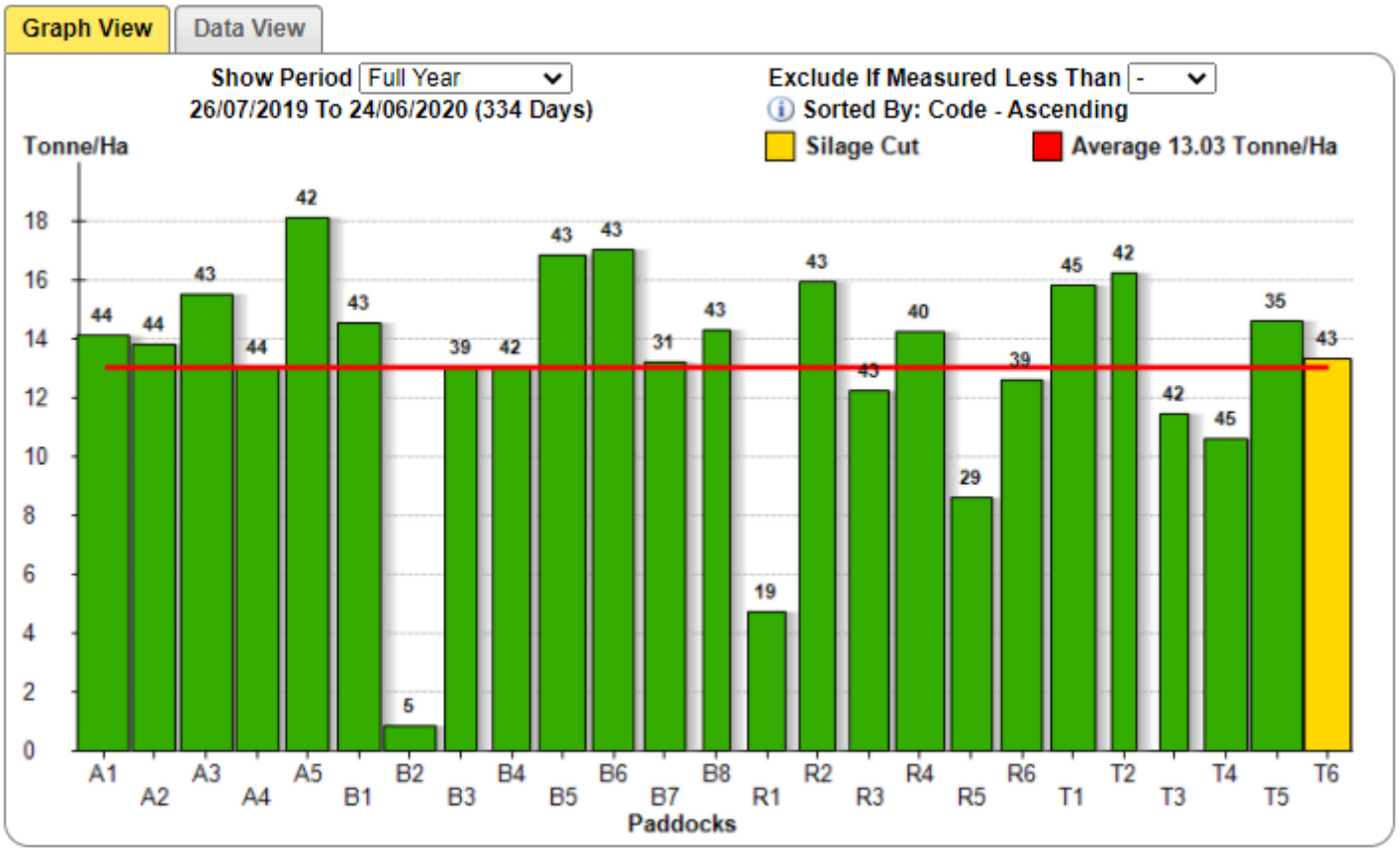
**Multiple Farm Comparison**

Useful if you have multiple farms in your group, or in this case a group of farms in Takaka who share their data. Really useful to confirm your growth rate, how your farm is going.

| Farmer | | | | | | | Grass Date | Cover | SR | Cover /LU | Target PreGrz | Pre Graze | Post Graze | De mand | Grow Rate | Rotat Back | Rotat Now |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| My Farm | | W | B | S | A | T | 30/09/2020 | 2130 | 3.22 | 195.6 | 2727 | 3400 | 1600 | 56.4 | 59.8 | 17.6 | 20.0 |
| [redacted] | | W | B | S | A | T | 01/10/2020 | 2105 | 2.70 | 224.1 | 2657 | 2855 | 1600 | 46.0 | 51.3 | 26.6 | 23.0 |
| [redacted] | | W | B | S | A | T | 30/09/2020 | 2200 | 3.30 | 212.1 | 2813 | 3824 | 1600 | 52.7 | 34.5 | 19.6 | 23.0 |
| [redacted] | | W | B | S | A | T | 25/09/2020 | 2256 | 2.55 | 296.5 | 2823 | 2825 | 1600 | 51.0 | 33.4 | 35.9 | 24.0 |
| Average | | | | | | | | 2173 | 2.94 | 232.08 | 2755 | 3226 | 1600 | 51.5 | 44.8 | 24.9 | 22.5 |

**Paddock Performance**

- Confirms each paddocks yield for the season.
- You can make judgements and regrassing decisions on how paddocks perform relative to other paddocks in the same part of the farm, soils etc. Eg, paddock R1 is the sick cow paddock – not well monitored.
- Numbers based on the numbers of assessments.

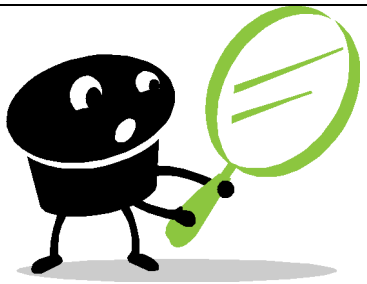


# Welcome to Lincoln University Dairy Farm (LUDF).

**The farm is a fully operational, commercial dairy farm with a number of potential hazards for both visitors and staff. Many of the 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.**

# Hazard Summary: Look, think, act.

The following chart provides a reminder of the types of hazards at LUDF. Watch for these and any other hazards that may be on farm today.

| | | |
|---|---|---|
| **People:**<br>• Uninformed / ill prepared visitors may be the greatest risk | **Animals:**<br>• **You are in their space** | **Milking shed:**<br>• Moving rotary platform<br>• Confined animals<br>• Chemicals |
| **Eyes / Ears:**<br>• Water / oil / milk / chemical splashes<br>• Welding flashes<br>• Loud machinery |  | **Touch:**<br>• Hot / cold surfaces, hot water, chemical burns<br>• Electric fences – treat them as high voltage power sources |
| **On farm machinery and tools**<br>• Chainsaws, hand tools etc. generate noise, fragments | **Potential slips / trips:**<br>• Uneven surfaces occur across the farm<br>• Fences<br>• Drains<br>• Underpass<br>• Effluent pond | **Vehicles:**<br>• Contractors and farm equipment – **act as though they can't see you** – keep out of their way<br>• Centre Pivot takes precedence over your plan |

**ARE YOU TRAINED FOR WHAT YOU ARE ABOUT TO DO? If not, STOP.**
**If you are uncertain how you should act or proceed, stop and contact the farm manager, other farm staff or your host.**

By entering this farm, you are acknowledging your receipt of this hazard summary, and your agreement to take personal responsibility to watch out for potential hazards, and act in such a manner as to protect yourself and any others also on-farm.