



Leading Innovation for
Southern farmers' prosperity

SOUTHERN DAIRY HUB

March Field Day 2023



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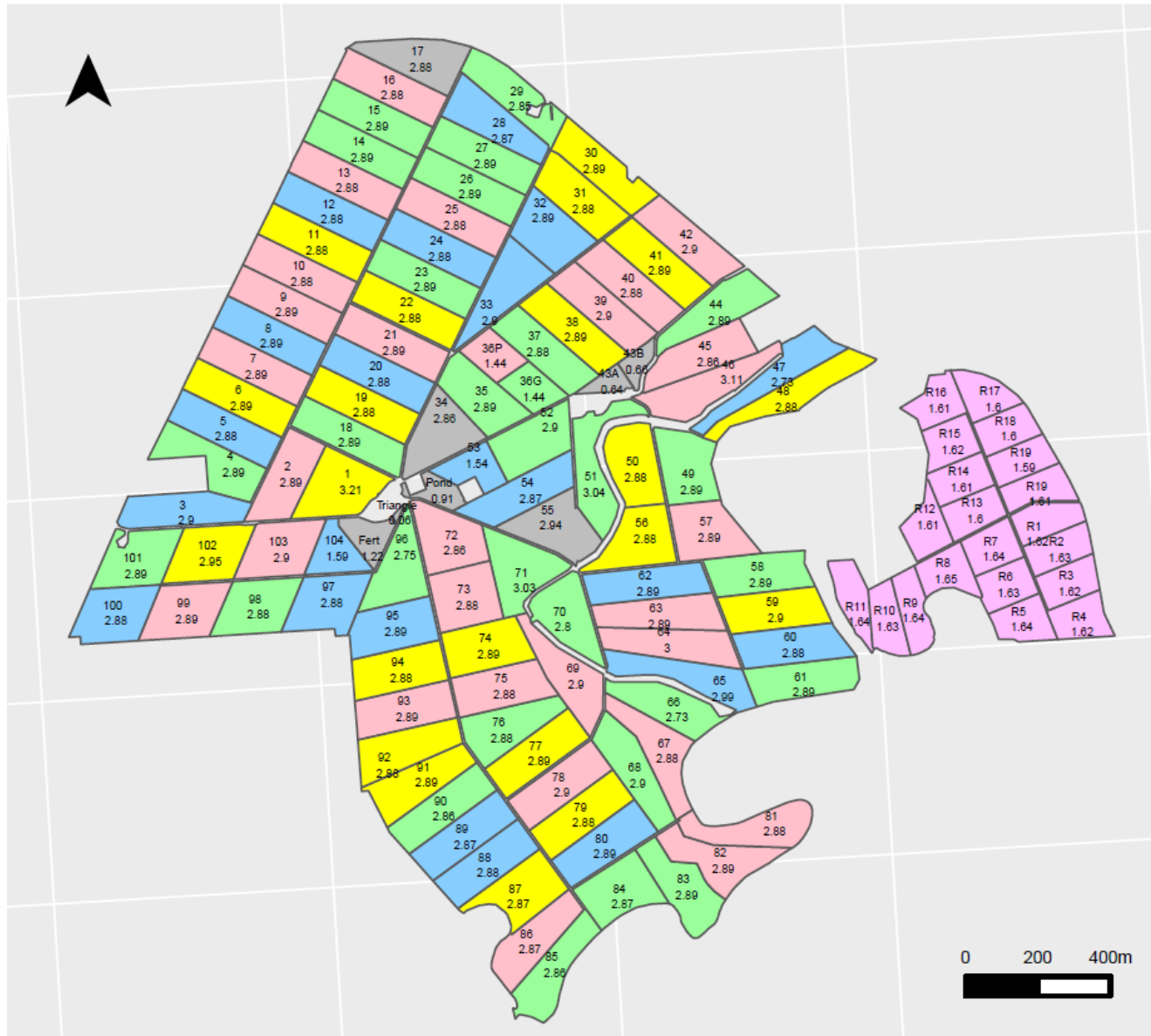
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Farm Map



Visitor Health and Safety Requirements

Entry onto property by permission and appointment only.

Contact either:


General Manager Louise Cook 027 564 5595 or

Farm Manager Billy Singh 021 115 5658

All visitors required to sign in and out accepting farm rules

A farm map will be provided showing any general hazards on the farm; the manager will instruct you of any new hazards

General Rules

- Children on farm – must be under constant adult supervision and only with express permission of manager
- Reporting – Please notify manager immediately any accidents or near miss events/hazards
- Drive to the conditions – Max speed of 30km/hr 
- Vehicles – no one to operate farm vehicles without manager's permission
- Water ponds/troughs – Keep a close eye on children around water sources – do not drink from farm taps, troughs, water ways
- In emergency – Please report back to farm manager at Assembly point in front of cowshed
- Fire extinguishers – found in farm houses, dairy shed, vehicles, and woolshed
- No smoking in cowshed, buildings, or vehicles

Biosecurity Requirements for Southern Dairy Hub (SDH)

All visitors must comply with Biosecurity Requirements when visiting SDH

- All footwear must be disinfected with materials supplied, upon arrival at and departure from the SDH farm site.
- All visitors are expected to wear clean protective clothing, including wet weather gear if necessary when on the farm(s).
- No farm visits will be allowed, from anyone within five days of their arrival in New Zealand from overseas.
- SDH retains the right at any time to refuse access to any person or persons deemed not to be complying with these requirements.

2022-23 Season update

The farm has had a strong start this year, with several years of cumulative work on herd BCS at calving to improve our reproductive performance and calving spread. In addition, the kind spring weather in August and September, good pasture utilisation and quality and access to very high-quality supplements has seen cows milking better on a per-cow basis.

The second sequential dry summer has taken the shine off the early season production, but advantageous culling opportunities and stronger feed contracts mean plenty of high-quality feed is on hand for the remainder of the season.

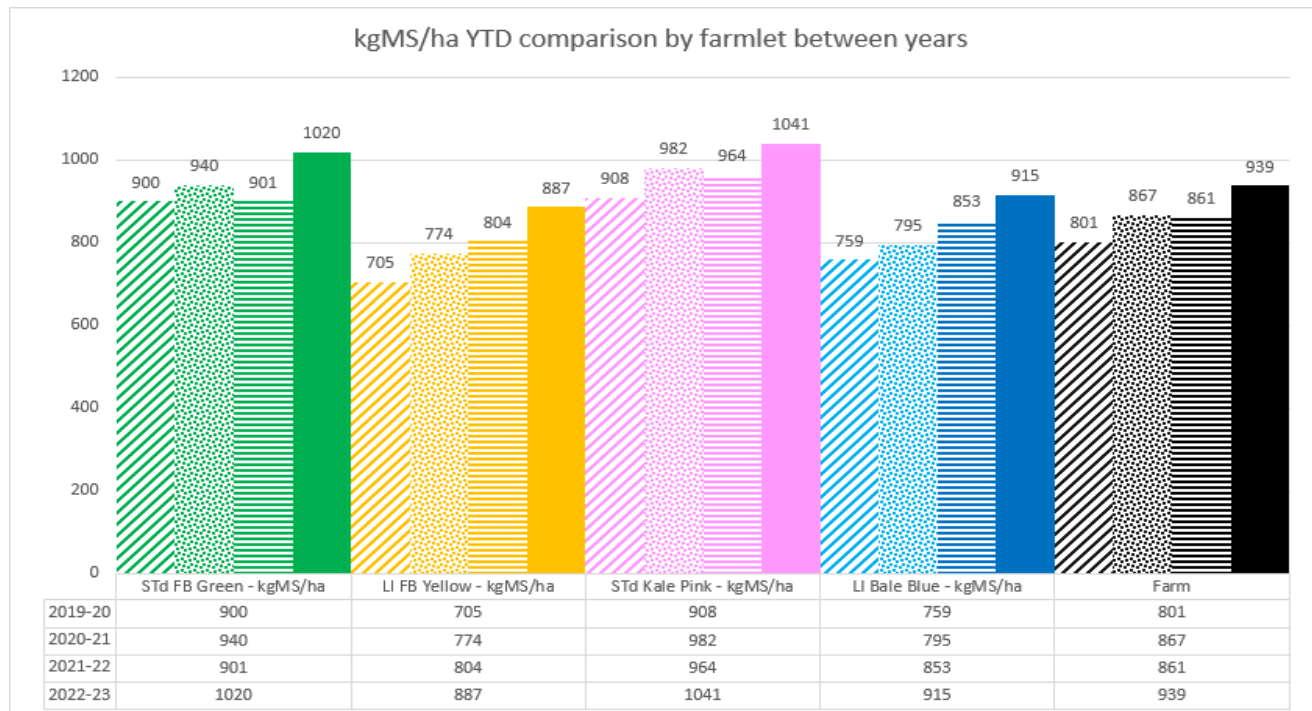


Figure 1: Cumulative season to date milk solids production (kg/ha) for the last 4 seasons

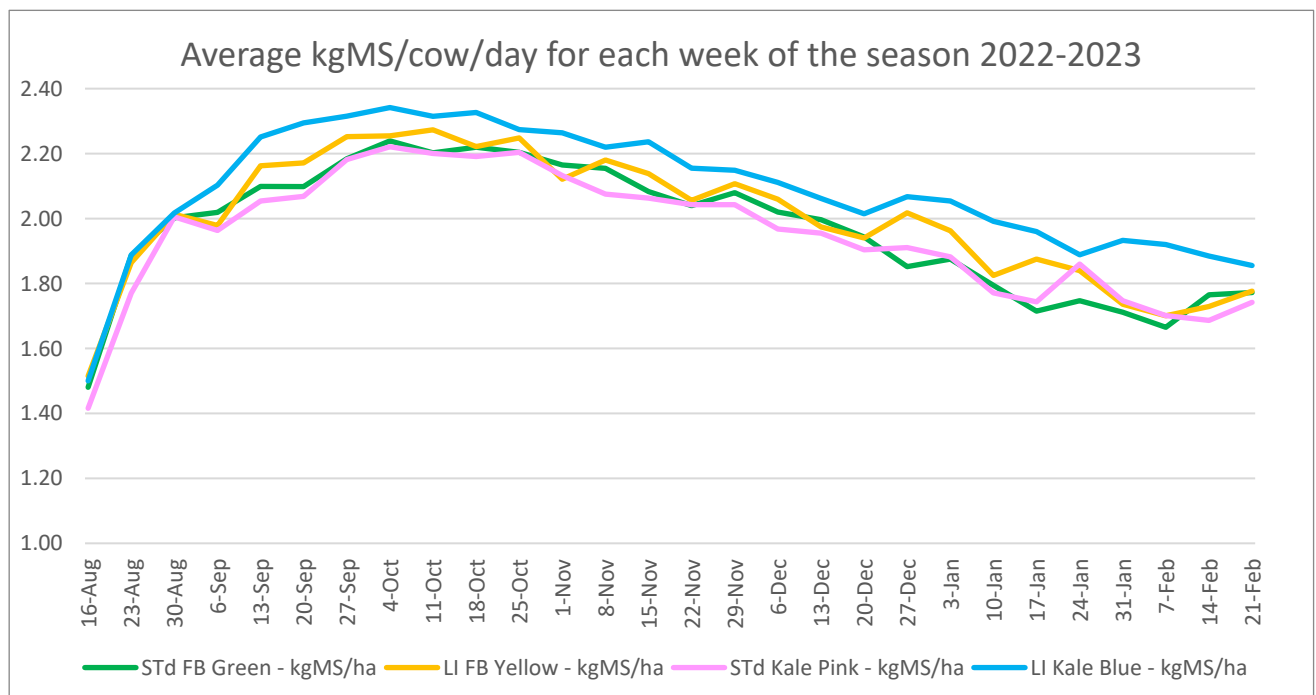


Figure 2: Average weekly milk solids production (kg/cow/day) and season to date production (kg MS/ha)

Mating performance this year has been a mixed bag. With no bulls being used on farm we anticipated a handful more empty cows that bulls might normally have picked up, which is largely what happened. But looking at the graphs below you can see a clear winner and clear loser between the four farmlets. We are confident that we "did things right" based on the performance of the Pink (Std Swede) farmlet and the consistency we are seeing from their results. The Blue (LI Kale/Bale) herd has always been our least predictable, either taking top honours or being the worst, but this is by far the biggest deviation we have seen.

When we see results like this, and we've set all our decisions to give all cows the same opportunity to perform – we call this a farmlet effect. It is evident this year that something in either winter feed, or seasonal nitrogen and feed management has sent the blues far from the group. While over the last 4 years they've been the least consistent, this year was a surprise to us, until we saw the data from our Allflex collars indicating this result in early January.

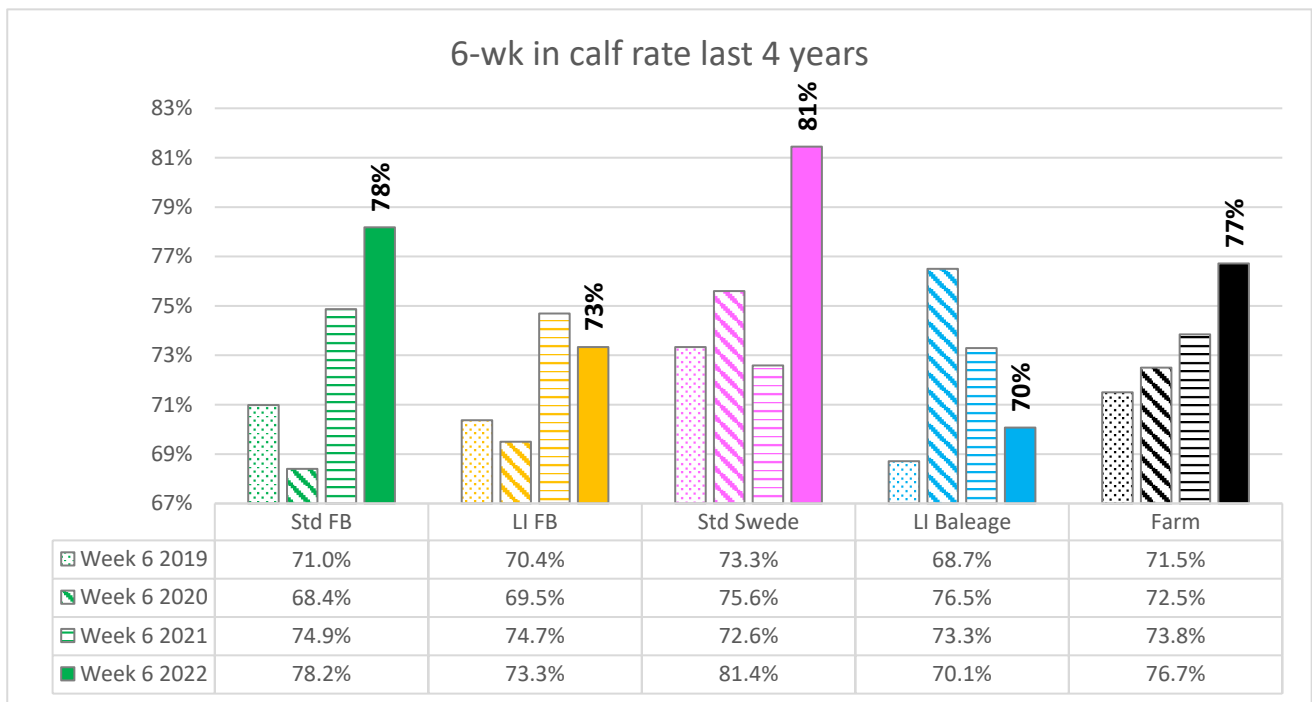


Figure 3: 6-week in-calf rate result for each herd last 4 years

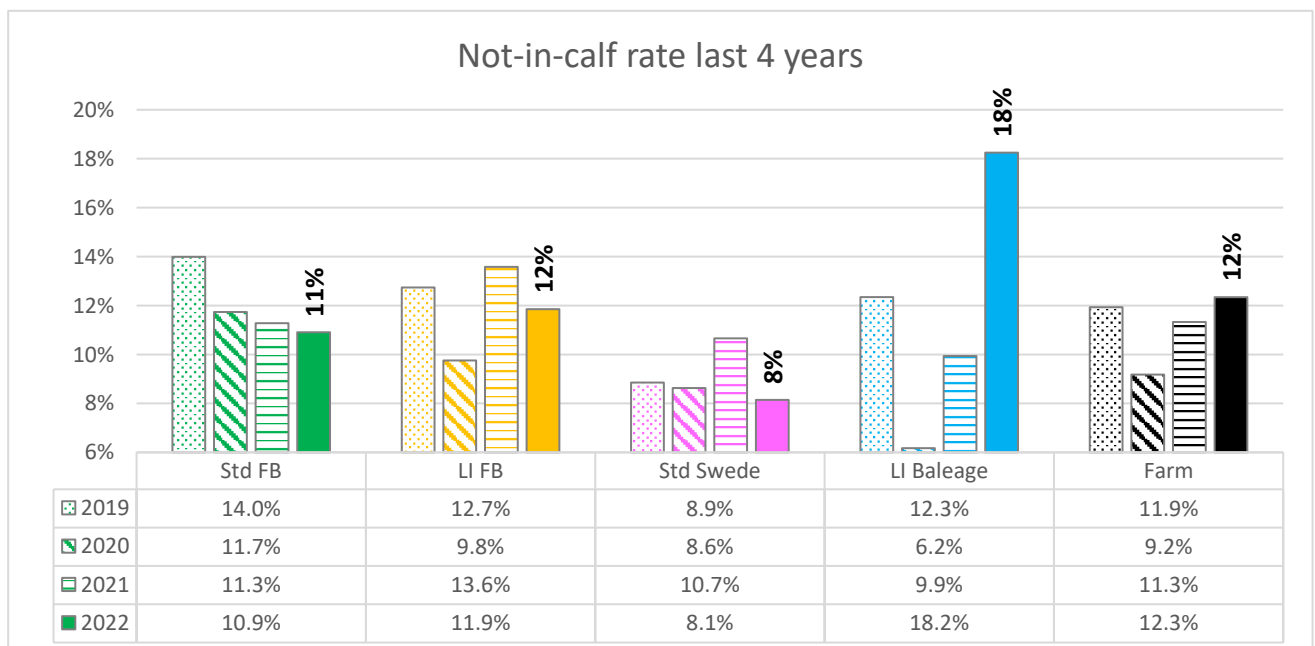
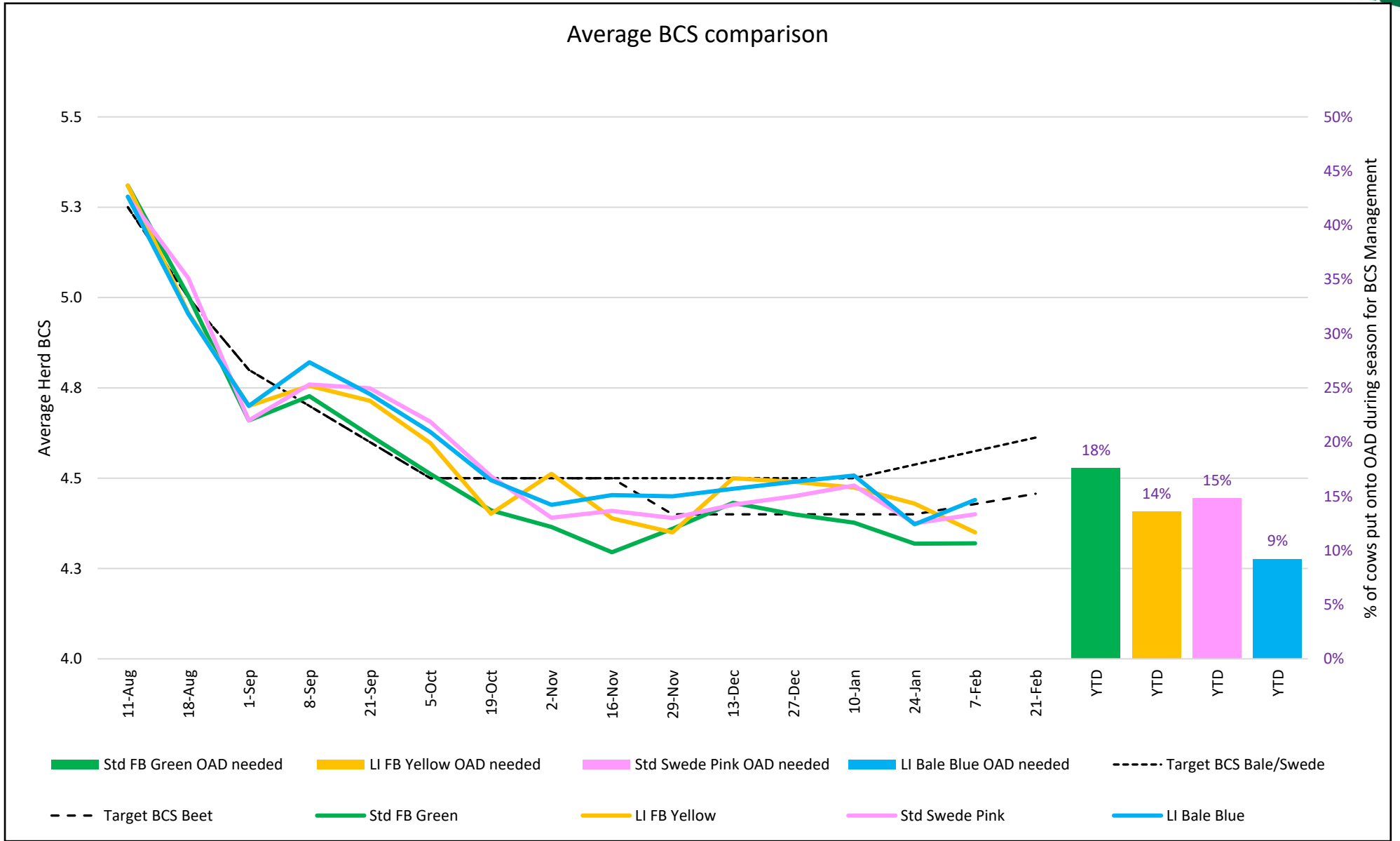


Figure 4: Not in-calf rate (empty plus cows culled pre-scanning) for each herd last 4 years.

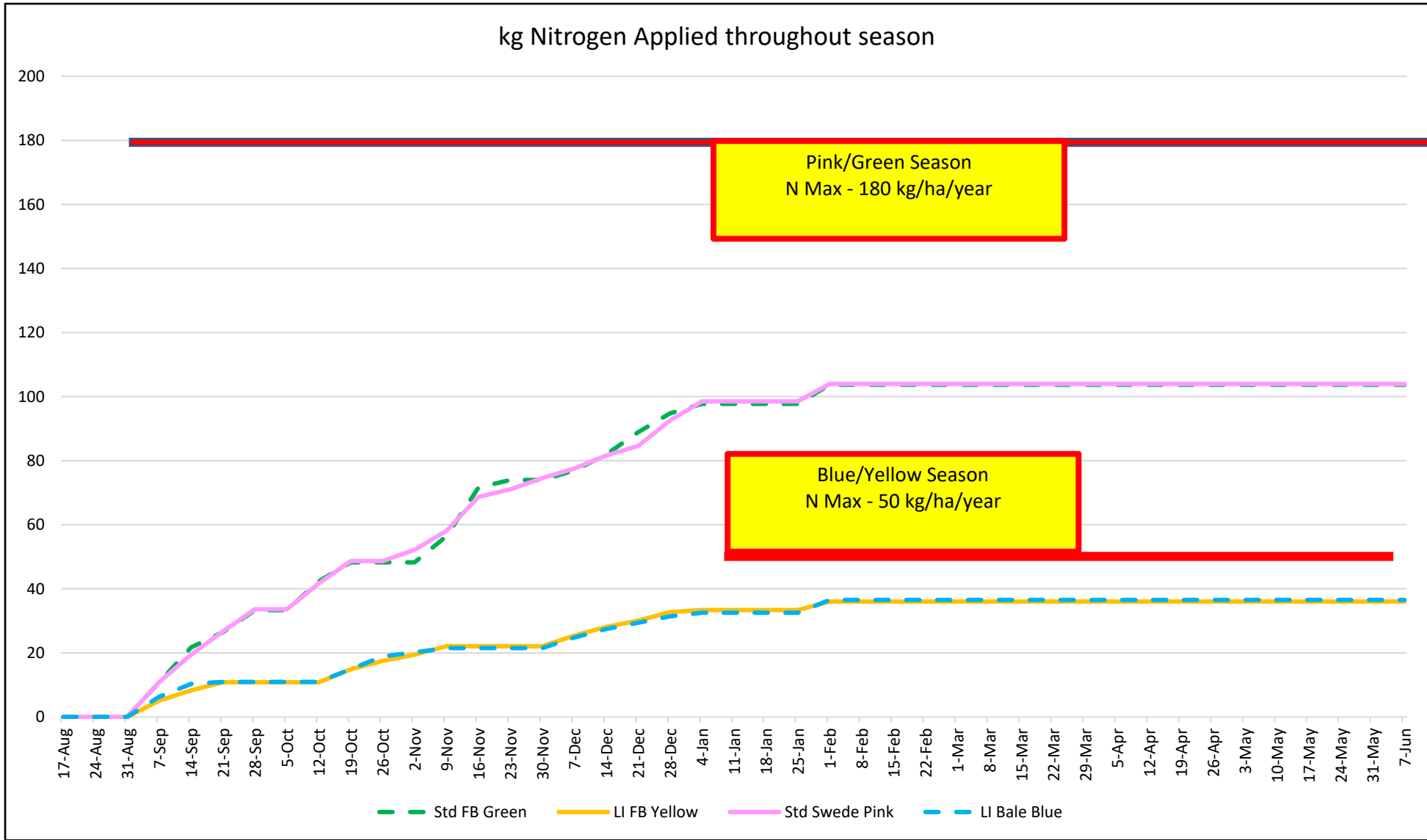
	Std Swede Pink	LI Bale Blue	Std FB Green	LI FB Yellow
Winter Feed Milking supplement	Swede/Bale	Baleage	Beet 80 days	Beet 60 days
	In-shed feed 500kg/cow + silage as required			
Pasture Stocking rate (current)	2.8	2.3	2.8	2.4
Average Cover kgDM/ha	2188	2243	2257	2256
Average Growth kgDM/ha/day	18	20	17	19
Last week rotation (days)	36	41	37	35
Last week supp (kg DM/cow)	6.9	5.2	6.0	5.5
% of herd on priority management	15%	9%	18%	14%
Milk yield (kgMS/cow)	1.71	1.86	1.78	1.78
Nitrogen Cap kgN/ha/yr	180	50	180	50
% Nitrogen used (kgN/ha) YTD	58% (104kg)	72% (36kg)	58% (104kg)	74% (37kg)
YTD Pasture growth TDM/ha	9.1	8.6	9.3	8.2
YTD supp (kg DM/cow)	762	488	678	482
YTD MS/cow	346	368	341	362
YTD MS/milk ha (YTD MS/farm ha)	1041 (929)	915 (828)	1020 (911)	887 (802)
Profit/ha vs Pink herd	\$0	-\$566	\$23	-\$492
Milk Production	Another hot week challenging milk yield, but relatively stable production on 3 in 2 milking.			
Pasture and Feed	Pre-graze pastures are becoming more consistent and certainly looking more tasty for cows. We welcome the 20mm of rain received this week, a blessed relief! Maintaining rotation length, and about to move into feeding stack silage over baleage to all herds.			
Animals	Calm week on the animals front with little to report. Fingers crossed for final scan this week. We are predicting a significant range in not-in-calf rates based on our monitoring collars, and differences in 6-week in-calf rates.			
Environment	Effluent pond maintained at minimum levels, with applications being used on new grasses where possible. No nitrogen applied to farm when soil & weather conditions won't see N converted efficiently to pasture growth.			
Wintering	1/3rd of our winter feed purchases arrived in the last week, and our Fodder beet is looking amazing and booked for a fungal spray to protect the crop.			
People	Our long-time research wizard Nicole left us on Friday - so she can do her PhD! We will miss her but wish her well.			
Research	No updates this week, the usual tasks are keeping the team very busy!			

Average BCS comparison



Growth rate and feed use comparison





Digging the dirt on soil types and optimising Nitrogen Use

Understanding Our Land to Drive Change – A Hedgehope Makarewa Catchment Group Project

Background

Working alongside Land & Water Science, the Hedgehope Makarewa Catchment Group has recently completed a project using state of the art technology to map the catchment’s landscape and its interaction with water quality and GHG emissions. The project, which was funded through Thriving Southland, aimed to really answer the question of “what is beneath my feet?”

Radiometric technology was used to create high-resolution hydrological layers in much greater detail than ever before. These layers show the landscapes susceptibility to erosion, greenhouse gas emissions, nitrate losses and phosphorus losses, amongst other things. The maps will help landowners to understand how variation in landscape characteristics drives water quality.

Ultimately, this information will allow landowners to identify where appropriate mitigations can be applied for the greatest, and most cost effective, benefit to water quality.

Knowing this level of detail may help possible future mitigations to be smaller in scale and in locations that are marginal to the farm or produce little value to the farm. A great example are wetlands which are a potentially very effective mitigation on a small, often low producing area of land.

Southern Dairy Hub involvement

The Southern Dairy Hub sits at the bottom of the Makarewa catchment and kindly agreed to be a case study farm for the project. This involved ground-truthing of the radiometric data by digging soil pits, shown below.

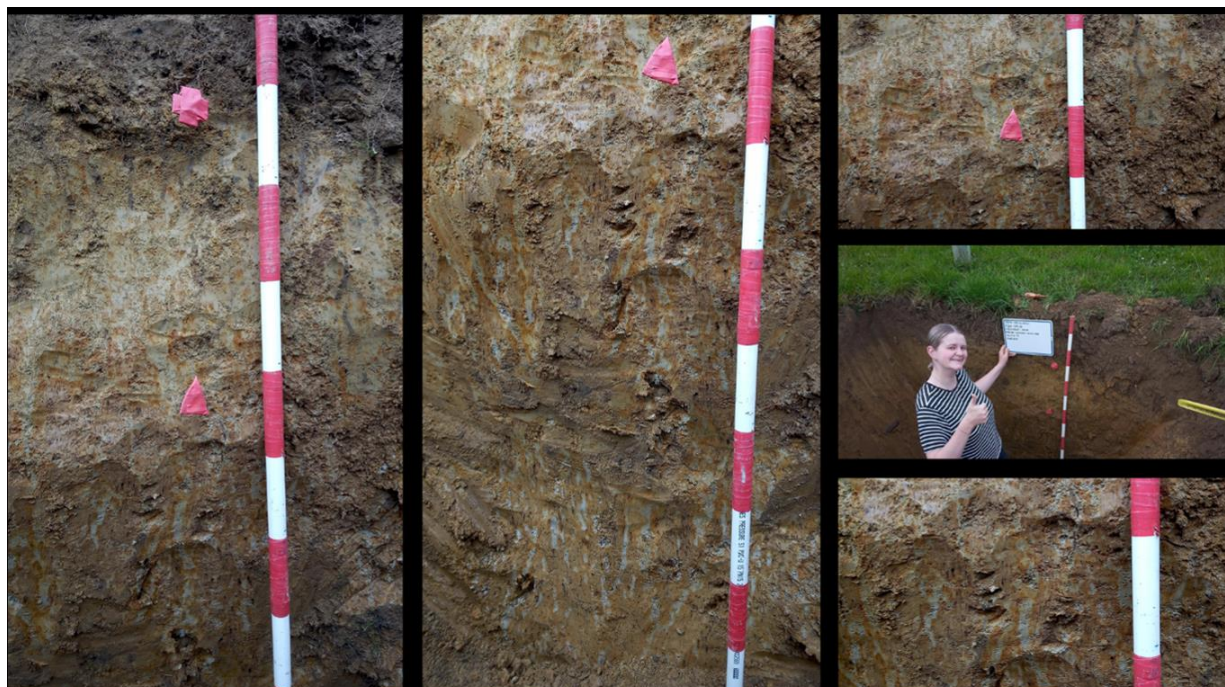
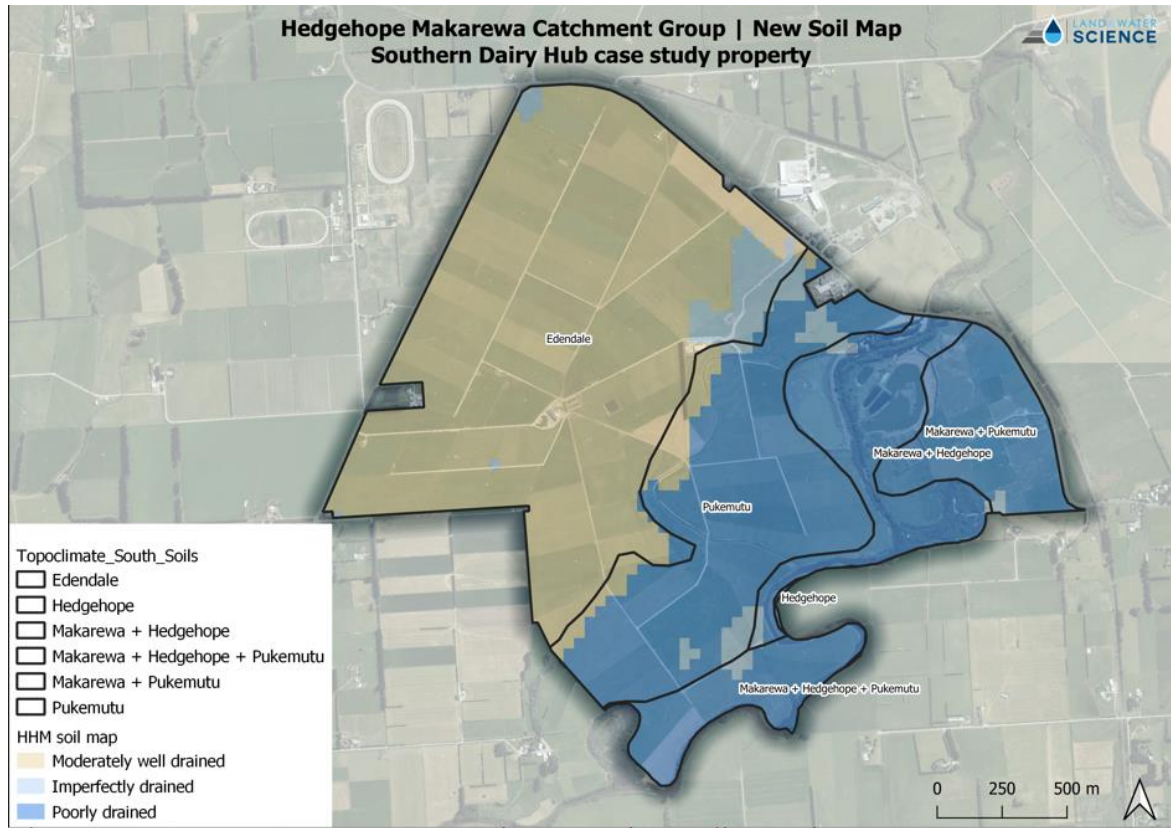


Figure 1. Photos of a soil pit dug on SDH. The soil is relatively poorly drained (shown by the mottles present). Previous soil mapping identified this area as a well-drained Waikiwi soil.

What the project tells us about the Southern Dairy Hub:

- We discovered that current soil maps are incorrect for the property (shown below), which aligns with the experiences of the on-farm team.
- Much of the property is highly susceptible to losses of nitrate-nitrite-nitrogen (i.e. nitrate leaching). These areas coincide with areas that are relatively well drained.



What we've learnt

- Our catchment has highly variable landscapes, often changing from one side of the paddock to the other.
- The 'one size' solution for water quality and greenhouse gas mitigations will not fit all.
- These maps, alongside farmers experience, can be used to choose appropriate mitigations and target them to the areas with the highest risk on your farm.
- **The maps cover the Makarewa Catchment including it's tributaries (shown below)**



You can find out more at <https://www.thrivingsouthland.co.nz/hedgehope-project-understanding-land/>

Wintering Recap – what are we changing and why?

If you're a frequent flyer with the hub, you'll know that our wintering practices have evolved over the past 5 years, with some small and some large changes.

Particularly we have worked very hard on techniques and practices that work towards better animal welfare on crop. Especially strategies that improve lying times in poor weather.

This includes the direction we graze crops in, use of emergency grass areas in the paddock saved for very poor weather and use of cereal straw as emergency bedding rolled out for cows.

Below is a summary of the key types of wintering we have used and a quick summary on the good bits, bad bits and welfare notes.

<u>Pros</u>	<u>Cons</u>	<u>Welfare items</u>
Kale		
Easy to establish, manage	Must "cut lines" daily	Pugged less if direct drilled
Equal cheapest crop to grow	Annoying to adjust break size and bale layout	Bigger area/day more fresh soil for lying
CleanCrop varieties no weeds		Smaller grass margins kept for lying
Swedes		
Easy to establish, manage	Can't double swedes crop due to disease	Pugged less if direct drilled
Equal cheapest crop to grow – better yield than kale		Bigger area/day more fresh soil for lying
CleanCrop varieties no weeds		Smaller grass margins kept for lying
Fodder beet		
Easy to adjust breaks	Insect and fungus management needed	Smaller daily fresh area offered per cow
Biggest yields	High risk if acidosis if breakouts occur	Double fence daily to avoid breakouts
Easy to gain body condition on cows with high energy & consistent quality crop	Needs phosphate mineral supplementation	We must keep grass margins in paddock for emergency winter lying areas, in extended poor weather
Significant reduction in nitrogen leached per cow wintered	Weed management challenging, particularly with minimum till	
	Poorer yields with minimum till	
	Expensive to grow	
Baleage		
Super easy to manage "yield"	At risk of baleage price changes	On grass, least pugging occurs
Super easy to feed out daily	LOTS of bale wrap to dispose of	Reduced "yield" of baleage may do less damage
No transition for cows	Baleage quality variability, puts whole diet at risk if poor	

One question we get asked is: **"Why no more brassicas"?**

We understand how to winter safely and effectively on brassicas now, and we have a strong indication of how the farmlet will perform when using brassicas. We can manage profit, performance, and people more easily in these systems.

When we look at environmental targets, particularly freshwater regulations governing area used for intensive winter grazing and nutrient loss to waterways, however, we had a few choices to make.

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With a resource consent, the extra area needed to winter on lower yielding kale is solvable. However, the higher nitrogen leaching from kale paddocks is a more difficult challenge to solve.

Fodder beet shows huge promise as a tool to reduce environmental impact, but achieving consistent cow performance across the season needs work – so we are continuing to hunt for potential scenarios that DO WORK for farmers.

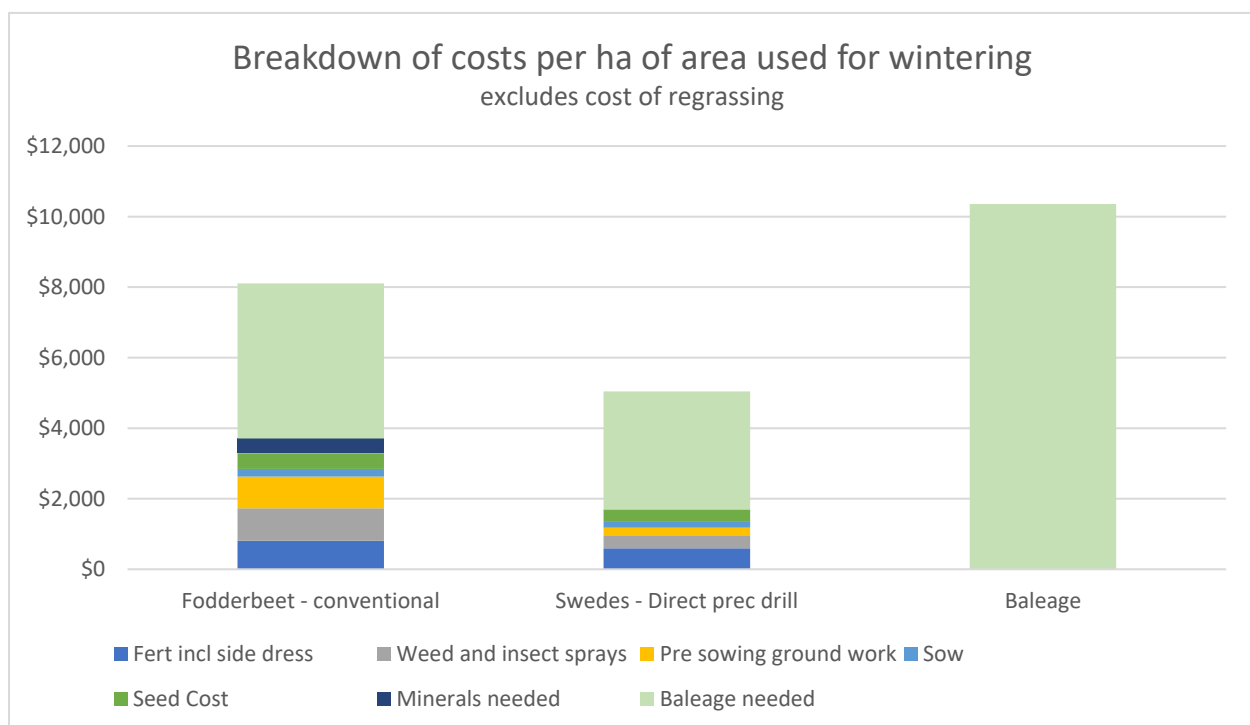
Wintering costs? Brassicas vs Fodder beet vs Baleage

Winter 2022 saw the first real change in wintering methods at the hub since the conversion of the property. We had a few scenarios on the go, and as such all cows from a farmlet weren't on the same feed type.

	Winter 2018-2021	Winter 2022	Winter 2023	Winter 2024
Pink	Kale	Swedes then Baleage	Baleage off platform	Silage off paddock
Blue	Kale	Baleage	Baleage	Baleage
Green	Beet 10 weeks	Beet 10 weeks	Beet 8 weeks	Beet 8 weeks
Yellow	Beet 10 weeks	Beet 8 weeks	Beet 8 weeks	Beet 8 weeks
Heifers	In farmlets	All farmlets together: Swedes (early calvers) / Baleage (late calvers)	In farmlets	In farmlets

When we look at what this cost each farmlet this past winter (with baleage purchased in the drought and variable quality), there's quite a discrepancy in how it shakes out. Let's start with the cost of generating one hectare of feed for each feed type (Table below).

	Crop Yield	Baleage supply	Total feed supply	Total cost/ha	\$/TDM supplied
Fodder beet (TDM/ha)	23	8.9	31.9	\$8,107	\$254
Swede (TDM/ha)	17	6.8	23.8	\$5,040	\$212
Baleage (TDM/ha)		24	24	\$10,356	\$451



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Notes on costings

In addition, each farmlet needs to pay to regrass each hectare that they winter on as the land is completely unproductive afterwards. At SDH, the land we winter on is on the milking platform, and around half our wintering area each year has been used for springers during calving which means we have to consider the cost of remediation for all area.

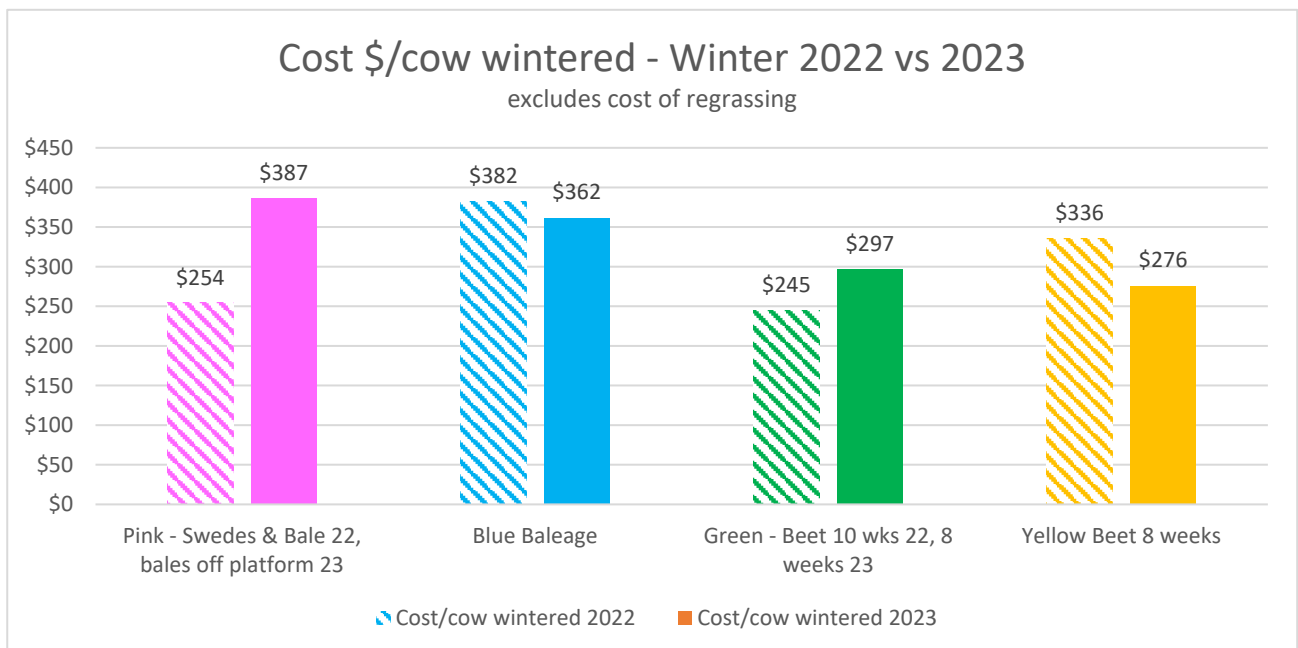
For the bale wintering systems; the baleage wintering area COULD be kept in the milking rotation all year and grazed for milk, or we remove the paddock from the farmlet and the feed has an opportunity cost for not going to milk. Either way you look at it if the grass goes to milk no bales are made on the area for wintering.

Whether we graze this area or not, and make baleage on this area or elsewhere around the farm, the amount surplus baleage within the farmlet is still insufficient to winter on. The split of baleage for wintering is around 30% of the total baleage need can come from within the farmlet and the rest bought in.

Cost to winter in 2022 by farmlet

Farmlet	Pink - Swedes & Baleage	Blue Baleage	Green - Beet 10 weeks	Yellow-Beet 8 weeks
Number of cows wintered	230	141	230	141
Total Farmlet area	82.7	60.9	82.7	60.9
Area used for wintering	9.1	5.5	7.1	5.5
% of Farmlet used for wintering	11.0%	9.0%	8.5%	9.0%
Total cost winter 2022	\$58,513	\$53,856	\$56,421	\$47,334
Total cost/ha wintered	\$6,428	\$9,803	\$8,000	\$8,616
Cost/cow wintered	\$254	\$382	\$245	\$336
Cost/cow/week (assuming 10 weeks)	\$25	\$38	\$25	\$34
Cost to regrass each ha	\$1,399	\$1,399	\$1,399	\$1,399
Cost of regrassing total	\$12,733	\$7,685	\$9,866	\$7,685
Cost per bale homemade, moved, recycled		\$55/bale		
Cost per bale bought in delivered, moved, recycled		\$118/bale		

When we consider the 2023 potential cost, the overall purchased baleage price comes down to about \$100 bale and this influences the cost/cow wintered. However, wintering system changes to the Pinks & Greens also affect costs: Pinks more expensive without brassicas, Greens less time on beet, more on baleage. And all mobs using baleage wintering areas are at an 18 TDM baleage supply this year, meaning more hectares are needed.



The Farm

Farm Area

Milking platform: 299 ha

Support Block: 39 ha

Unproductive land: 2 ha

Milking infrastructure

60 bale rotary dairy with DeLaval plant and Delpro Herd Management software

Automatic cup removers and on-platform teat spray, Automatic drafting and weighing

Greenwash on the backing gate

Climate

Mean Annual Maximum Temperature - 17.7 °C

Mean Annual Minimum Temperature - 5.4 °C

Average Annual Soil Temperature – 11.0 °C

Average Annual Rainfall – 785.4 mm

Soil Types

Table 4: Soil types, locations and characteristics on farm

Soil type	Location	Characteristics
Edendale	Top terrace	Well drained, high WHC, seldom dries out
Pukemutu	Through centre of farm	Poorly drained due to sub surface pan between 600 and 900 mm deep. Vulnerable to waterlogging.
Makarewa	Bottom terrace	Poor aeration during wet periods due to poor sub surface drainage and slow permeability. Severely vulnerable to waterlogging in wet periods.

Staffing and management

Roster System – Year-round 8 on 2 off, 8 on 3 off

Milking Times – cups on at 5 am / 2.30 pm

Effluent System

Two receiving ponds with weeping walls, leading into a storage pond. Effluent applied by travelling irrigator.

Solids cleared out November 2018. Some effluent applied by umbilical system in March 2019. Greenwash on the backing gate

Herd Details

Table 5: BW and PW as of 26 February 2023

		BW	PW
Pink – Std Swede/Baleage	Cows (230)	202	253
Blue – LI Baleage	Cows (141)	205	258
Green - Std FB	Cows (230)	203	254
Yellow – LI Kale	Cows (141)	217	271
Grouped	Yearlings	275	286

We would also like to recognise and thank the businesses who continue to support us, specifically:

