SDH Winter field day

The SDH journey
Research vs demonstration
Kale vs fodder beet – which was the winner?

Brought to you by the SDH partners, research and farm teams

29 June 2023

SOUTHERN DAIRY HUB

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Agenda

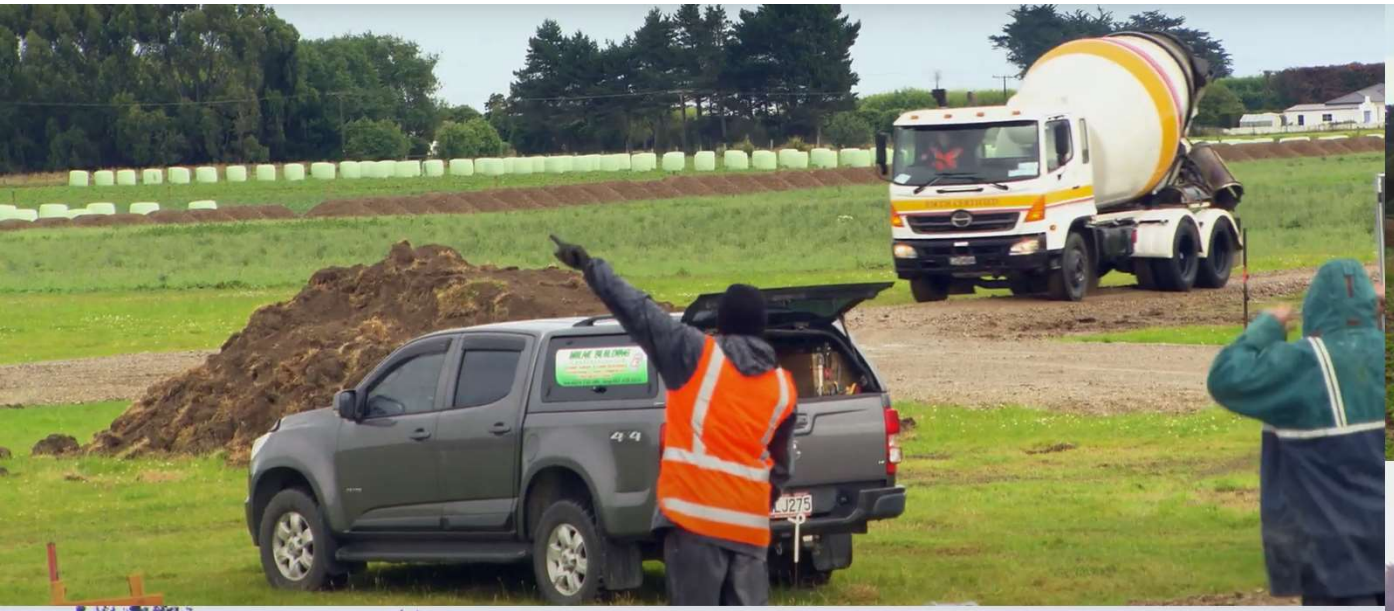
- Welcome and introductions
- Background of SDH & the partners – Luke Templeton (SDDT Trustee)
- Regional Research Priorities – Richard Kyte (Research advisory chair)
- Kale vs Fodder beet farm systems results – Dawn Dalley
- Farm walk (weather permitting)
- BBQ sponsored by Ravensdown

The SDH Journey

Luke Templeton

SDH development


Southern Dairy Hub




VOLVO
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First research project winter 2017

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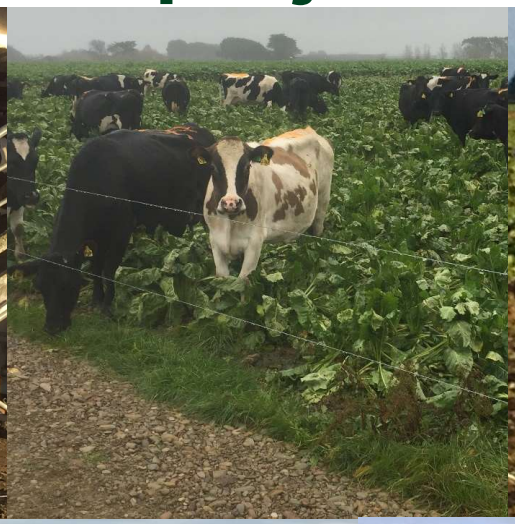



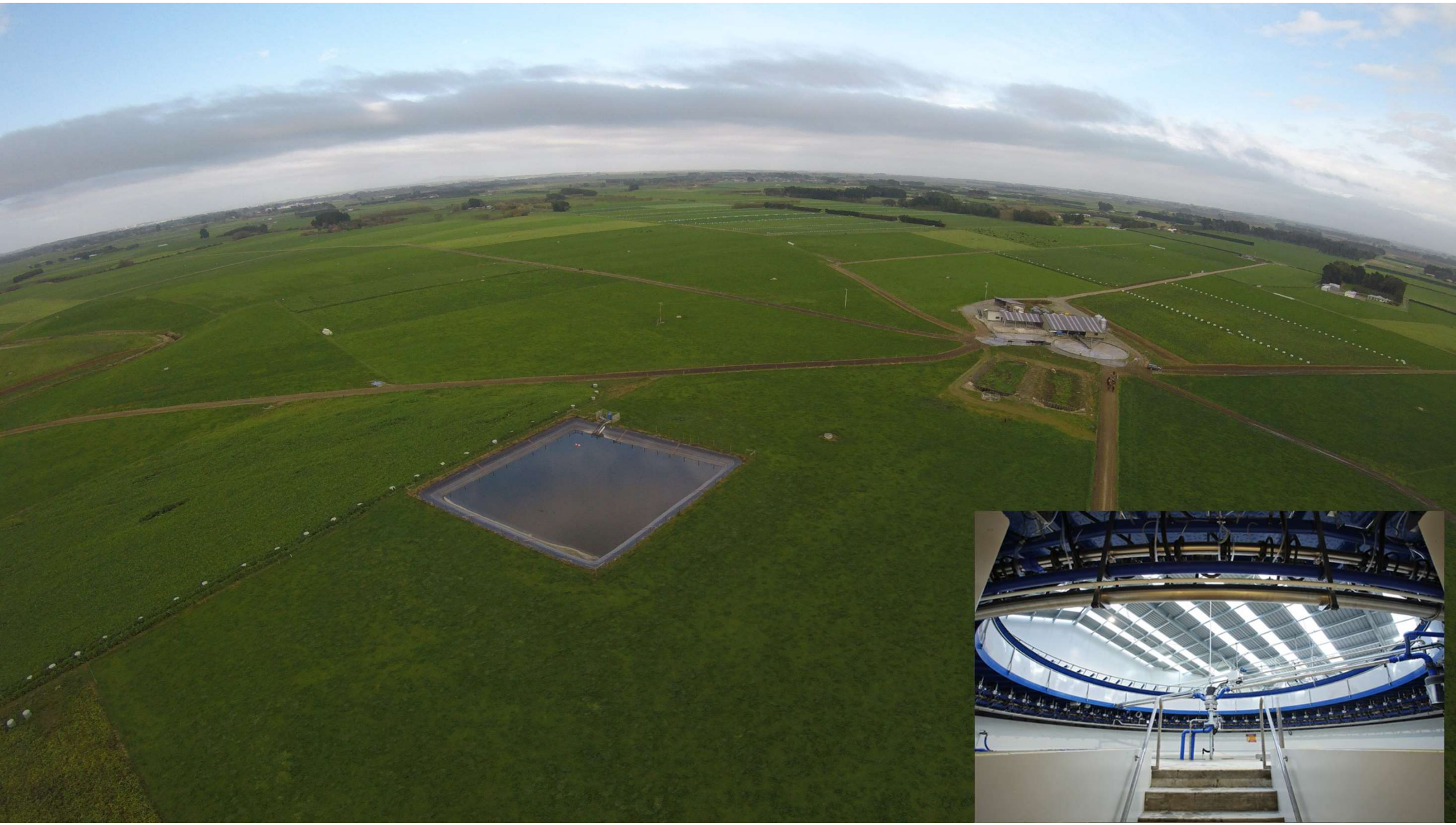

Regional Research Priorities

Richard Kyte

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Why we're here

The Southern Dairy Hub is a 349ha commercial scale Research dairy farm at Wallacetown near Invercargill.

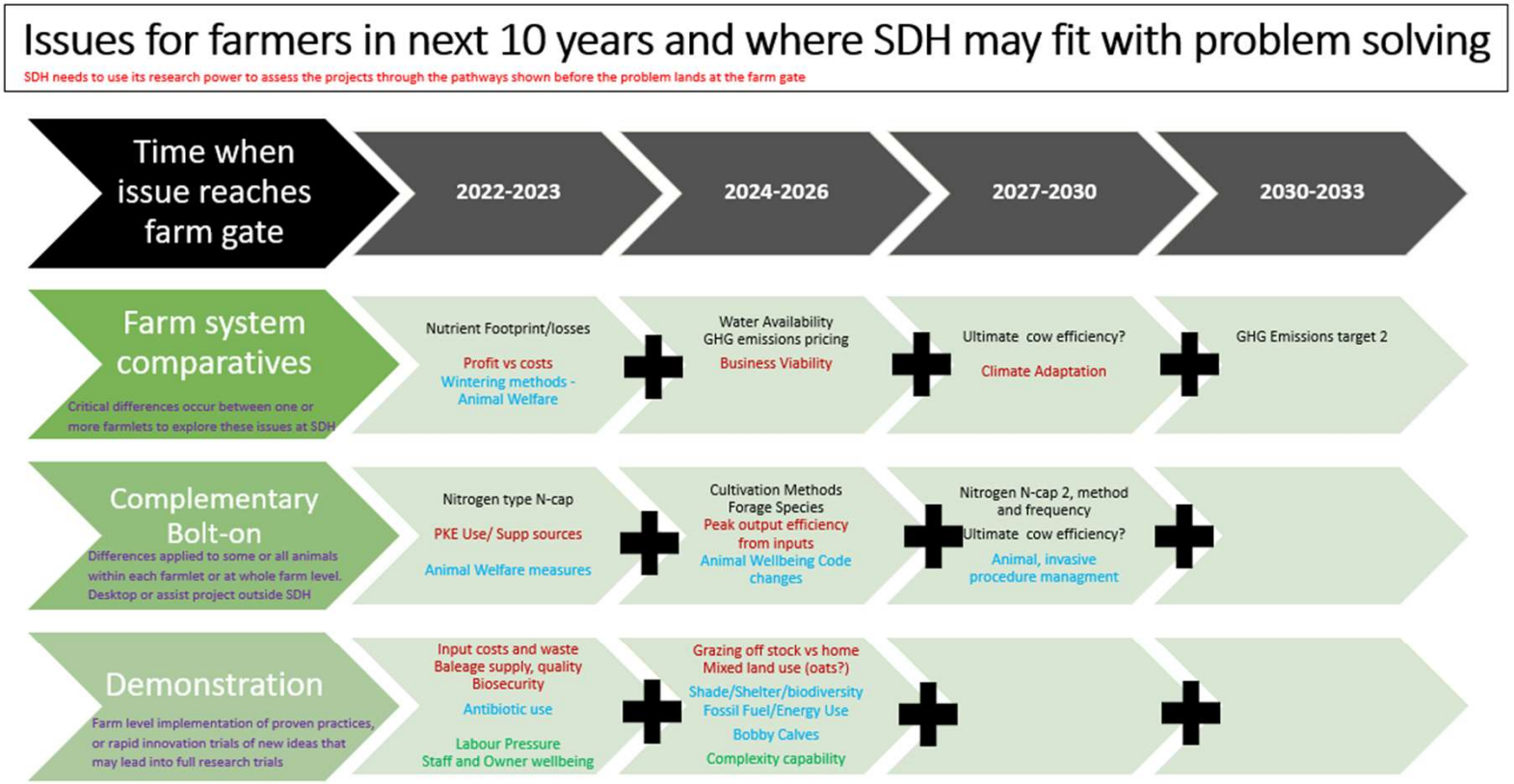
Created by collaborative ownership between Southern Farmers' & Businesses donations (via Southern Dairy Development trust) and Industry (DairyNZ), Research (AgResearch) to purchase and convert the property now owned by and known as the Southern Dairy Hub.

What we do:

Deliver research projects that provide future focussed information for New Zealand Farmers.

Research operations at the Hub centre around providing Farm systems comparative research at scale. The creates many opportunities for additional research to be carried out as off-shoots to the main program. Profitability, Animal behaviour, physiological differences, environmental

SDH Research strategy



Issues facing farmers are grouped into four categories based on text colour:

Farming Footprint
Business Resilience
Social License to farm
People

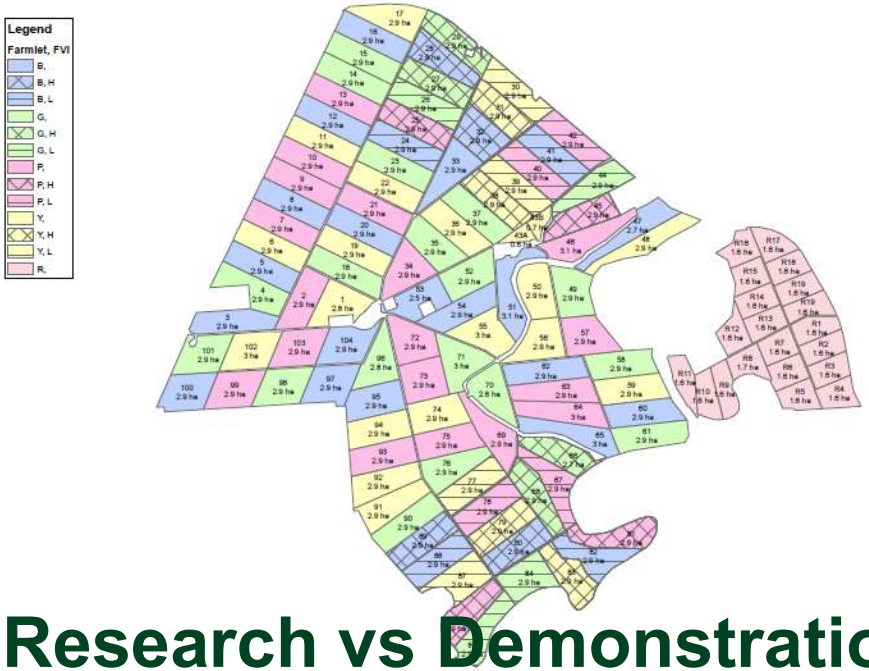
Role of the research advisory committee (RAC)

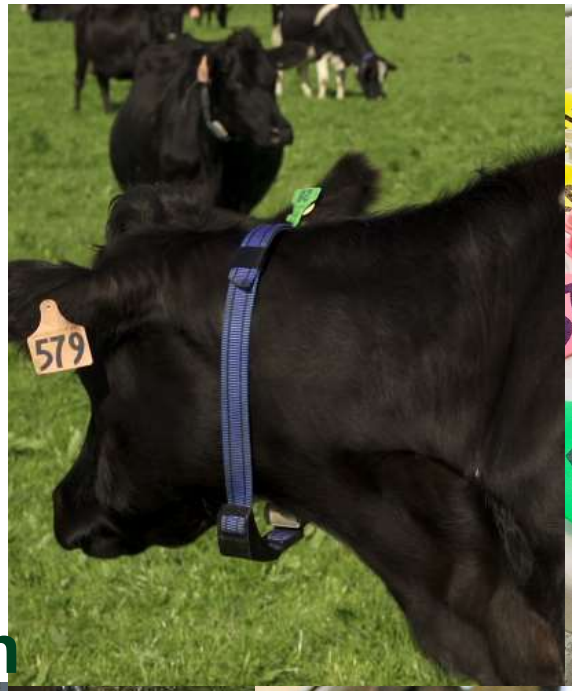
Role of the RAC

- Review all proposed research
- Actively plan research for the farm
- Link research opportunities for the farm
- Consider the needs of the southern South Island dairy industry
- Understand the relationships between providers and funders of research
- Identify risks to the farm of proposed research

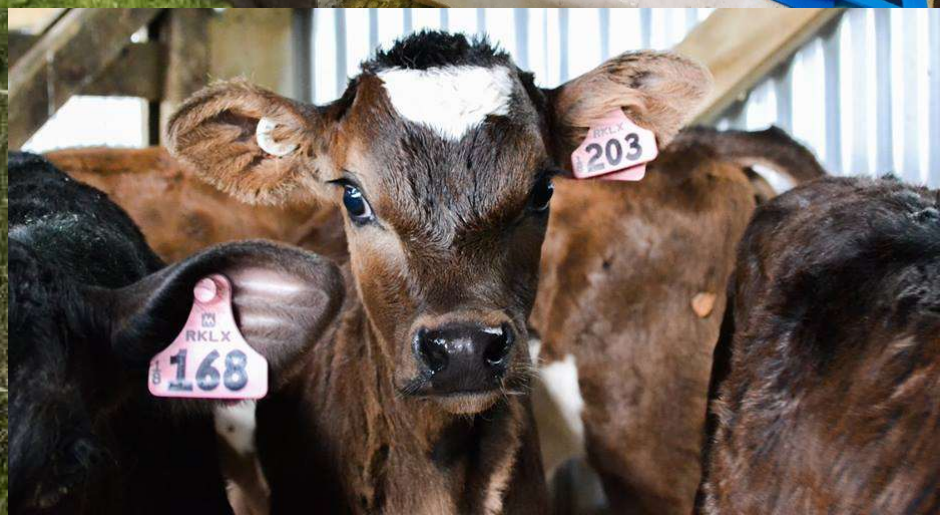
Current members of the RAC

- Richard Kyte (chair)
- Simon Topham
- Jaime McCrostie
- Stewart Morrison
- Peter Dobbie
- Dawn Dalley (DairyNZ)
- Mark Neal (DairyNZ)
- Robyn Dynes (AgResearch)
- Mike Dodd (AgResearch)
- Andrew Miller (Fonterra)





Research vs Demonstration



Farm Systems Research

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Farmer research priorities in 2017

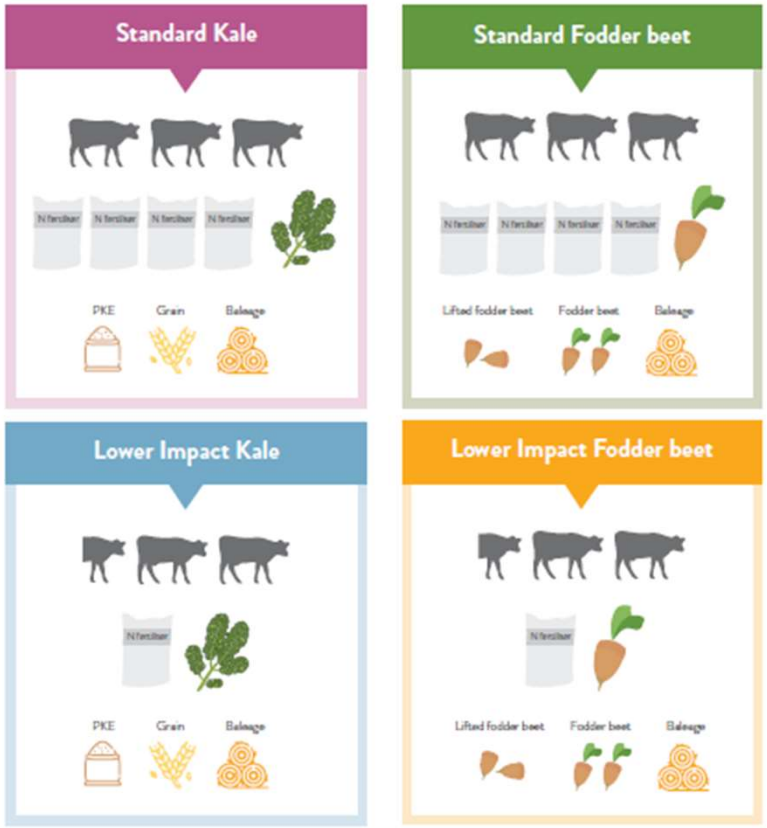
- Wintering
- Fodder beet
- Achieving nutrient loss reduction targets
- Off paddock infrastructure

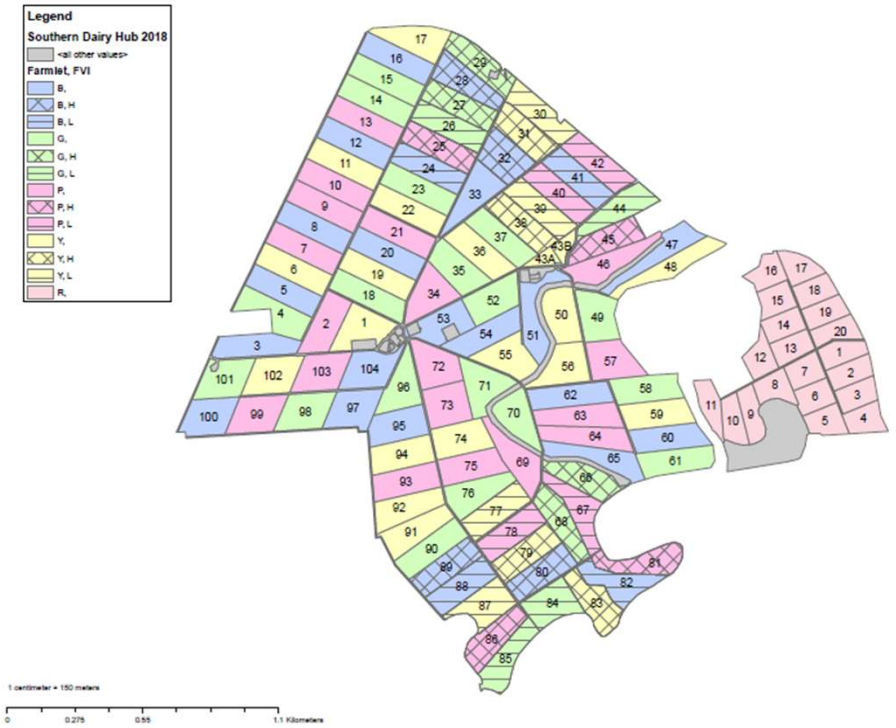
4 Year farm systems trial funded by DairyNZ

Objective

To test the opportunity for crop choice and nitrogen management to reduce N footprint on a Southland farm by 30% and improve profit compared to existing practice.

Farm Systems Recap



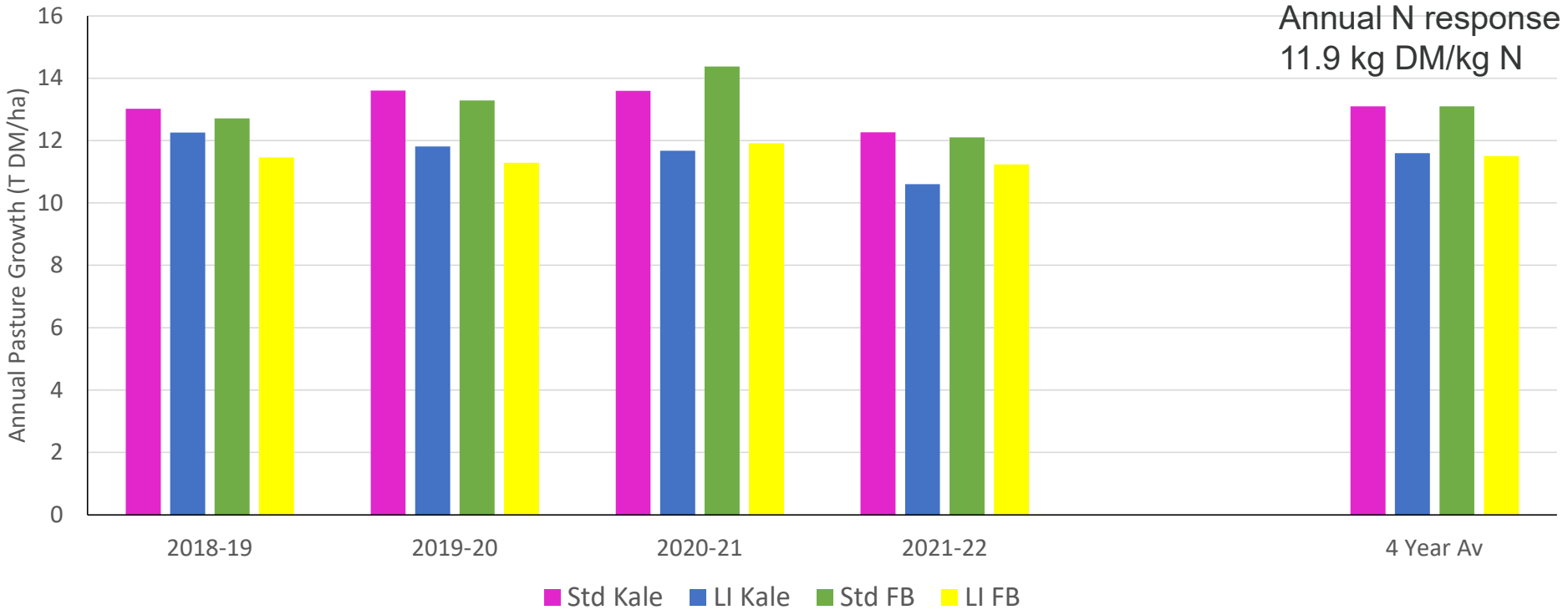


Behind the results

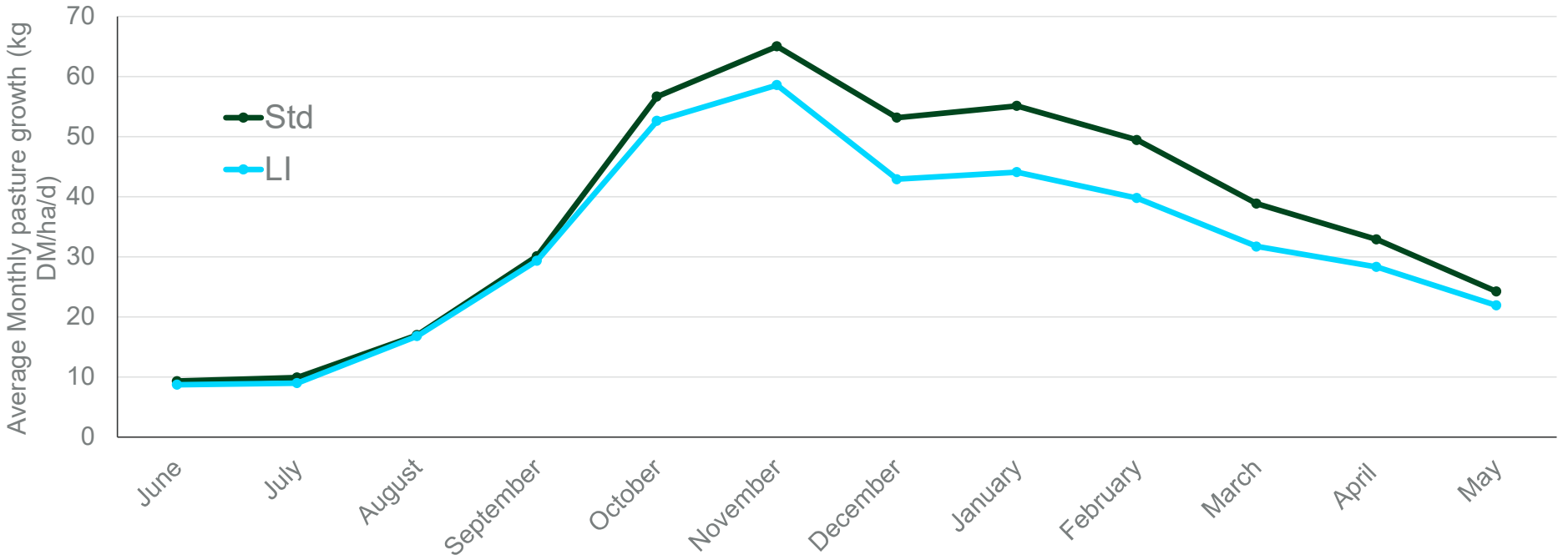
- ~ 9,400,000 farm walk steps
- ~1,598,400 milk yields
- 72 herd tests
- 59,200 individual cow body condition score assessments
- 4608 blood samples
- 650 pasture samples
- 972 crop yields
- 344 botanical compositions

AND LOTS MORE

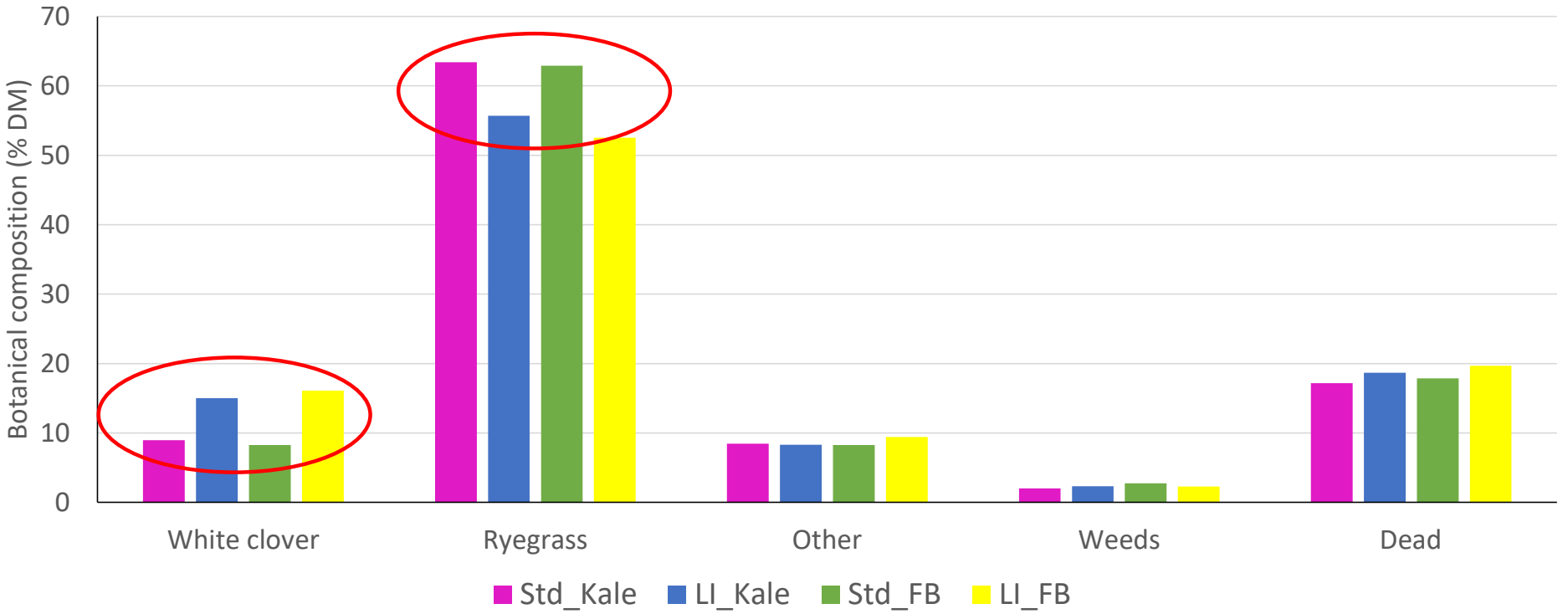
Lower impact (LI) farmlets grew less pasture



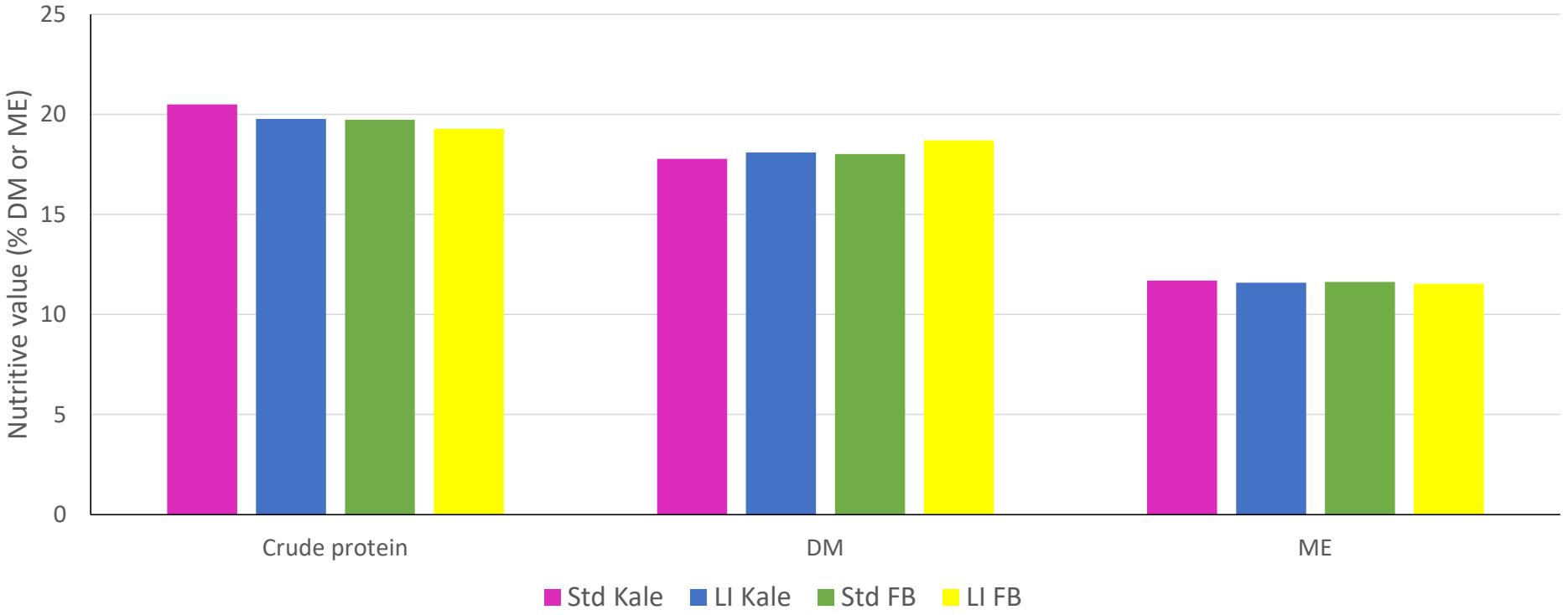
Divergence in growth rate from October



More clover and less ryegrass in LI farmlets



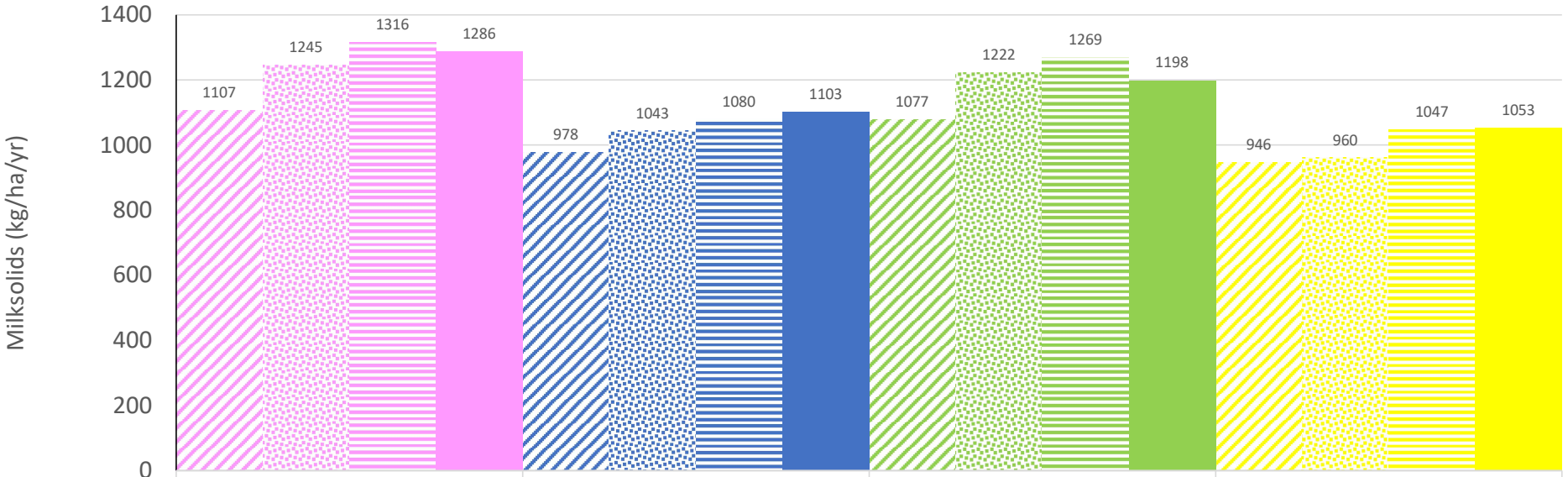
Similar average pasture quality, some seasonal differences



Maintaining pasture residuals was more challenging in the LI systems

- Similar area mown for baleage across farmlets
- Slightly more baleage per cow conserved by LI farmlets
- More area topped to reset residuals in the LI farmlets
- Less total area mown in the kale compared with fodder beet farmlets

Increased milksolids with years post conversion



	Std Kale	LI Bale	Std FB	LI FB
2018-19 to 22 May	1107	978	1077	946
2019-20 to 24 May	1245	1043	1222	960
2020-21 to 24 May	1316	1080	1269	1047
2021-22 to 24 May	1286	1103	1198	1053

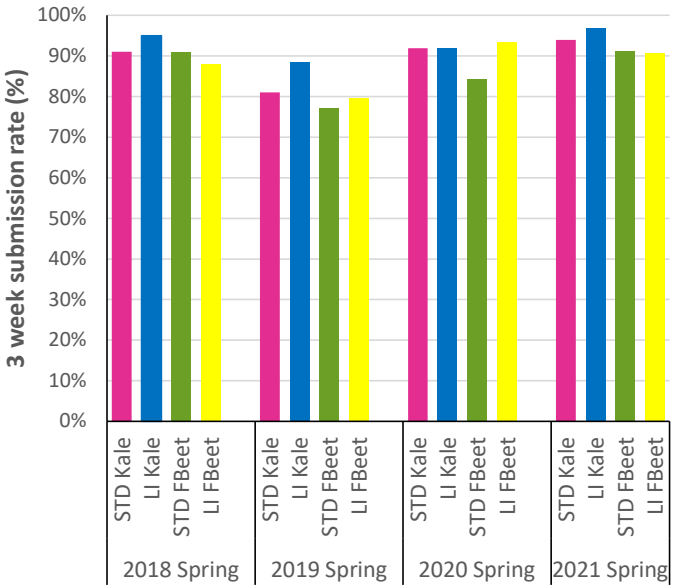
Milksolids production

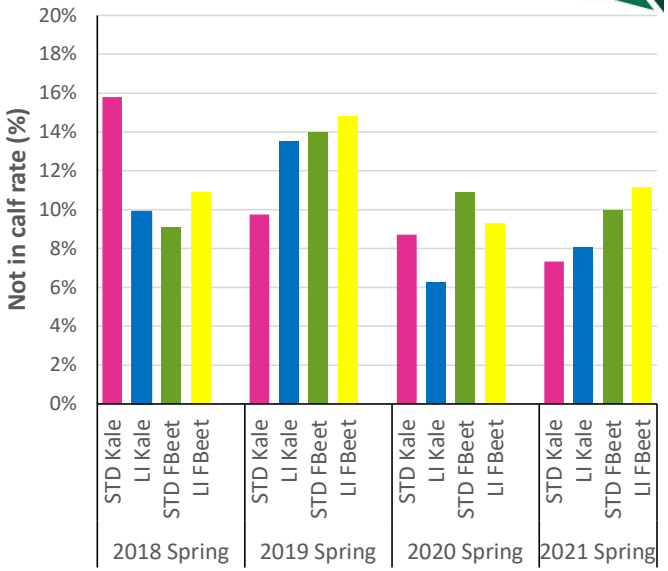
- Kale systems outperformed fodder beet in all four years
  - Fewer metabolic issues at calving
  - Higher peak milk production
  - More cows in milk at peak
  - Access to inshed feeding
    - Easier to feed
    - Consistent & better quality
    - Higher utilisation
    - Higher total supplements offered

	Baleage (kg DM/cow)	Fodder beet (kg DM/cow)	Inshed feed (kg DM/cow)	Total supplement (kg DM/cow)
Std Kale	188	0	448	636
LI Kale	168	0	367	535
Std FB	202	154	127	483
LI FB	215	145	107	467

- Only marginal increases in per cow production in lower impact systems
  - Similar comparative stocking rate
  - Challenges maintaining production post ryegrass heading
  - Timing of N applications

Unpredictability in reproductive performance





Generally better reproductive performance in kale systems

- Used less CIDR's - 10.7 vs 14.2%
- Had a higher 3-week submission rate
- No difference in in-calf rate
- Median time from calving to conception was 2 days shorter

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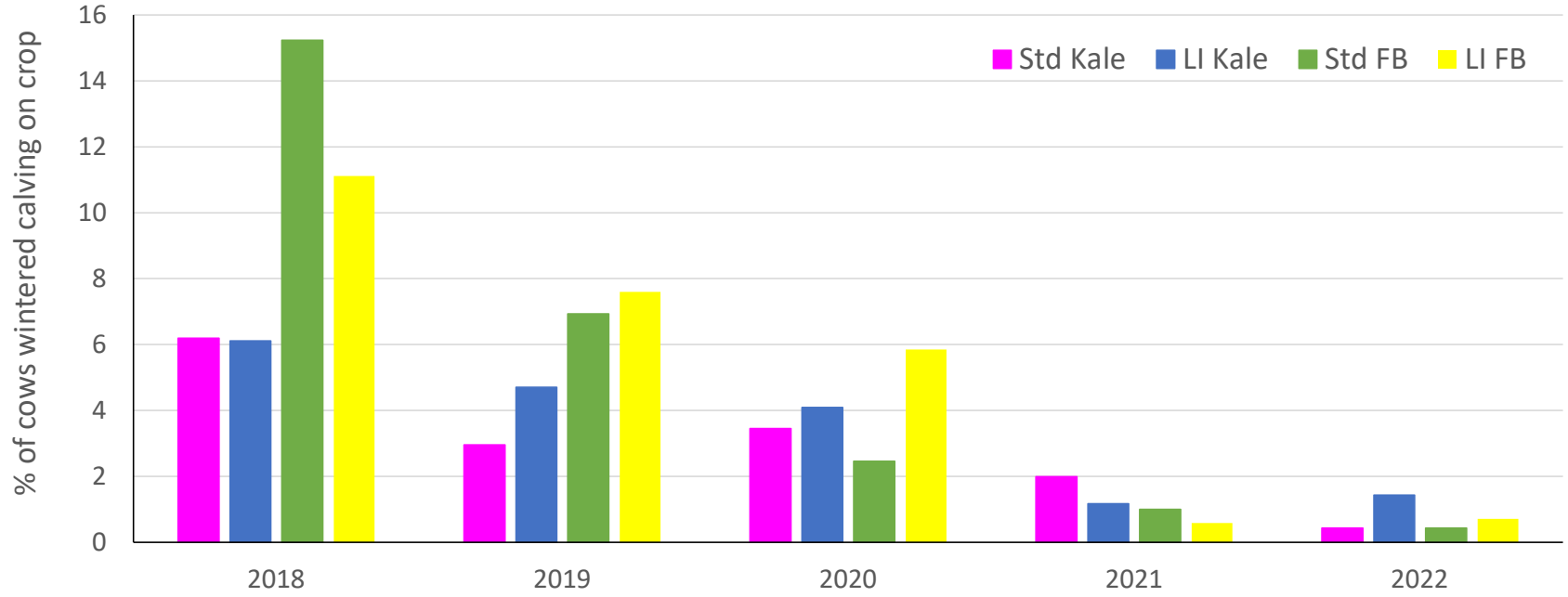
Higher risk of fodder beet cows calving on crop but risk has reduced with time



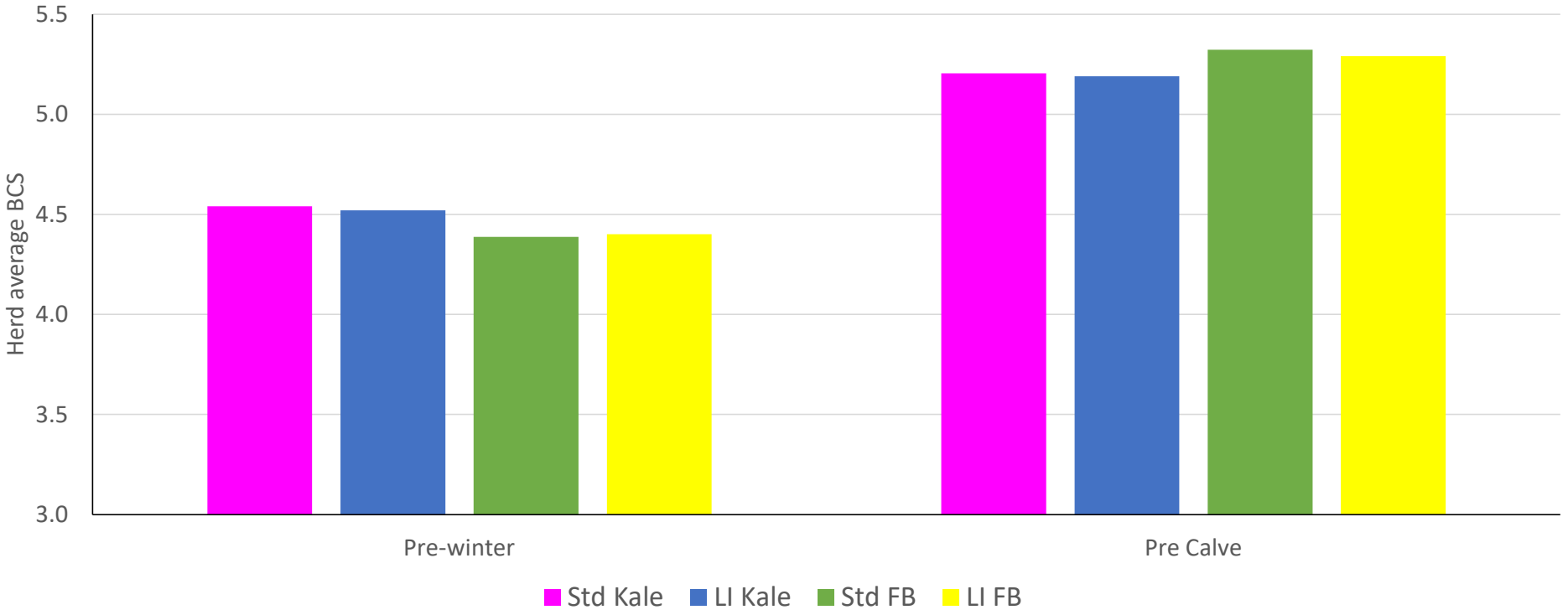
2018	2019	2020	2021	2022
Springer draft criteria: 7-10 days pre date or udder; drafting erratic, less experienced team	Springer draft criteria: 14 days pre date or udder, no heifer dates, drafting 2x/wk More experienced team	Springer draft criteria: 14 days pre date or udder, all preg dated, drafting 2x/wk Experienced team	Springer draft criteria: at least 14 days pre date or udder, all preg dated, drafting 2x/wk, Experienced team	

More chance of fodder beet cows calving early

- Fodder beet animals calved 0.9 days early and kale animals 0.6 days later than expected calving date
- Seasonal effect with animals calving increasingly earlier than expected: 2021/22 is 2 days earlier than 2018/19
- 2-year-olds calving 5 days earlier than expected and older animals 0.6-1.6 days later than expected

Year born	Number of animals	Genetic variation in Pregnancy length
2010	5	-1.84
2011	2	2.40
2012	14	-1.93
2013	22	-2.02
2014	42	-1.55
2015	66	-2.31
2016	61	-1.64
2017	75	-1.90
2018	114	-2.11
2019	150	-3.49
2020	188	-3.27
2021 yling	205	-3.34
Grand Total	944	-2.75

More consistent & greater winter BCS gain with fodder beet



Fodder beet systems had more health challenges

- More likely to experience metabolic issues at calving
- More likely to go lame during lactation
- Higher death rates resulting in less opportunity for discretionary culling

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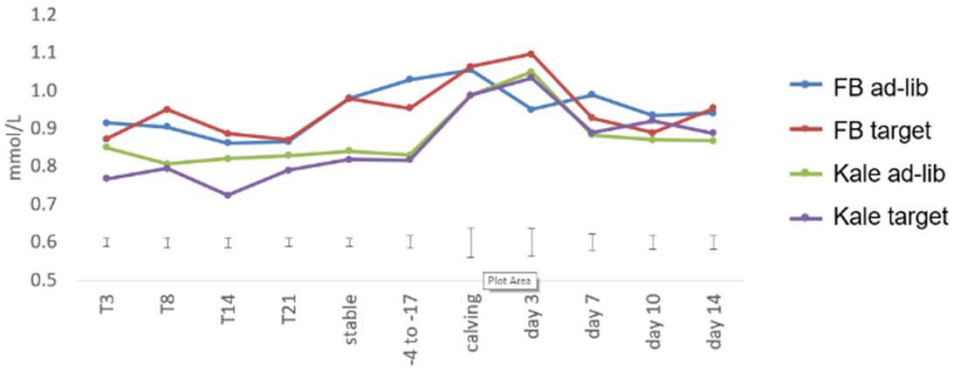
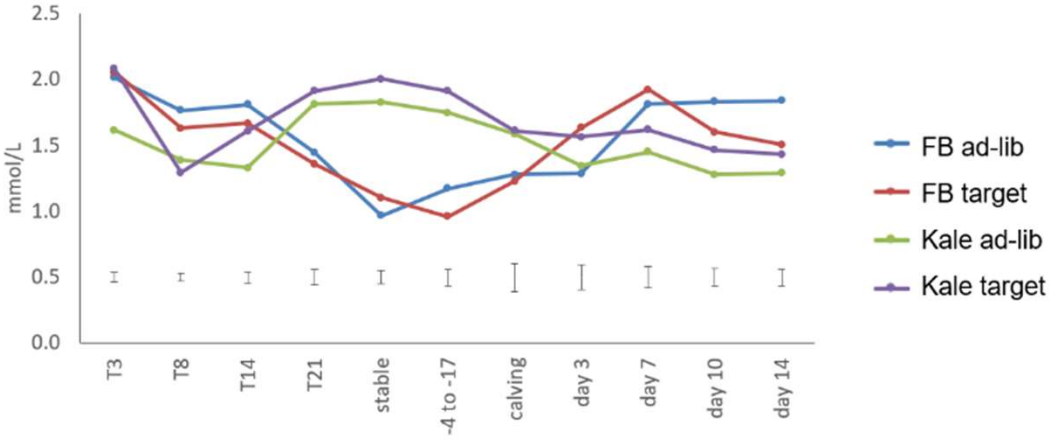
Crops result in different blood mineral levels

During transition and until calving low magnesium levels with kale – Mg supplementation needed to reduce risk of grass tetany



After transitioning until calving low phosphate levels with fodder beet – P supplementation required



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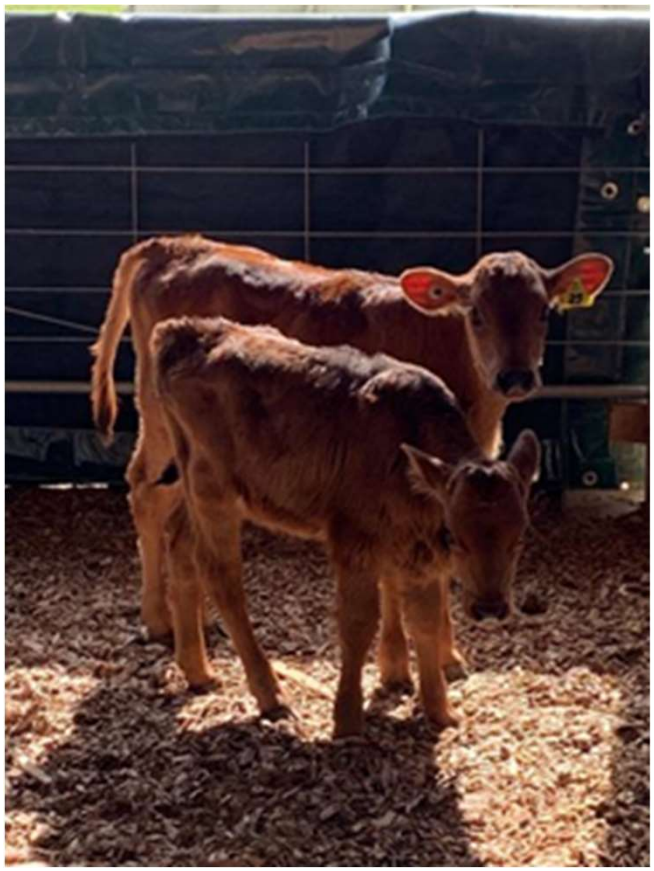
Calves born to fodder beet dams were 9% lighter, were shorter & had a smaller girth



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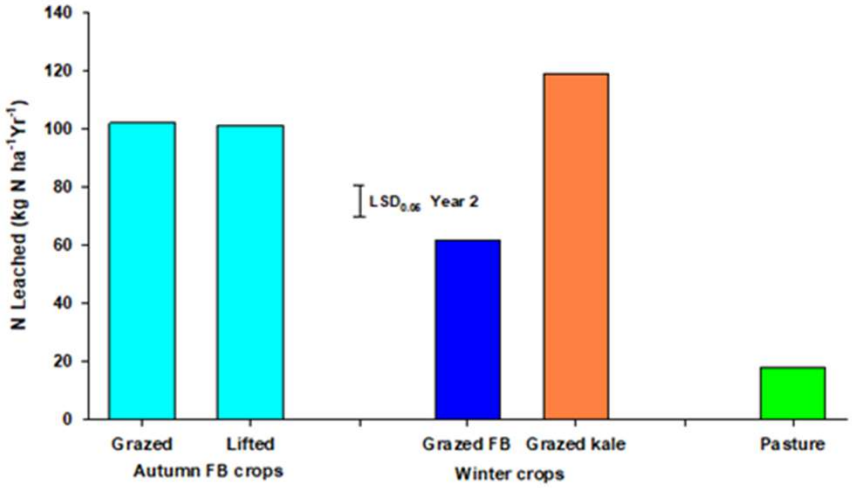
Lower leaching losses from fodder beet crops

- Measured leaching losses from pasture at SDH very similar to Overseer predictions
- Losses from autumn beet greater than winter grazed beet, in the absence of catch crops
- Lifting beet in autumn did not reduce N losses
- Leaching losses from fodder beet significantly less than kale (both on a per cow and per ha basis)



	Kale	Fodder beet
N leached kg per ha per year	106	55
N leached kg per cow wintered	5.6	2.0

Smith & Monaghan 2020 JNZG 82:61-71

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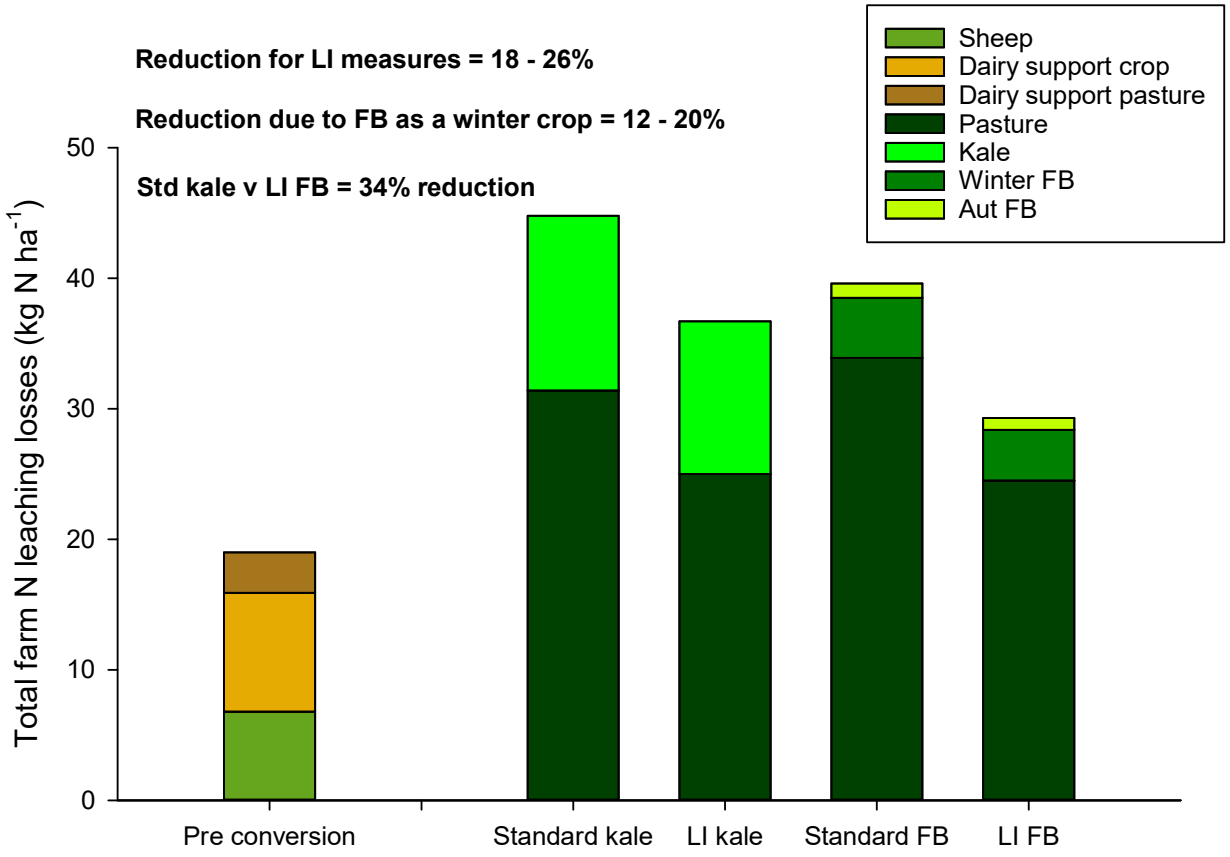
Fodder beet systems leached less N



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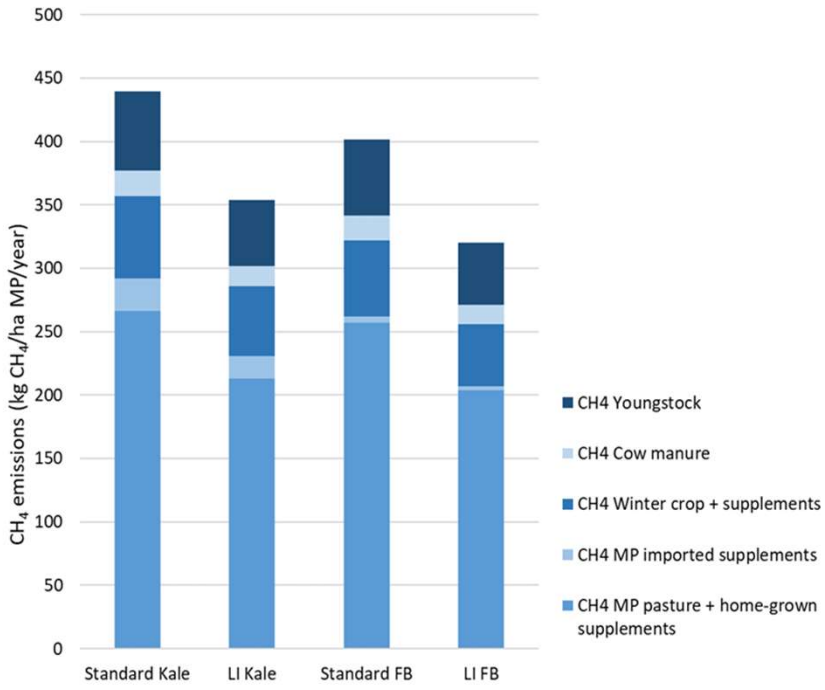
Lower methane footprint in fodder beet and lower impact systems

	Standard Kale	LI Kale	Standard FB	LI FB
Greenhouse gas sources and emissions				
Methane (kg CH_4/ha MP)	440	354	402	320
Nitrous oxide (kg CO_2e/ha MP)	2684	1865	1792	1339
Carbon dioxide (kg CO_2e/ha MP)	360	151	337	142



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Fodder beet systems not as profitable

	Std Kale	LI Kale	Std FB	LI FB
Net Operating profit $/ha	$3168	$2795	$2678	$2527
Profit differential cf Std Kale		$ -373	$ -490	$ -670
Operating expenses $/kg MS	$5.42	$5.30	$5.72	$5.63

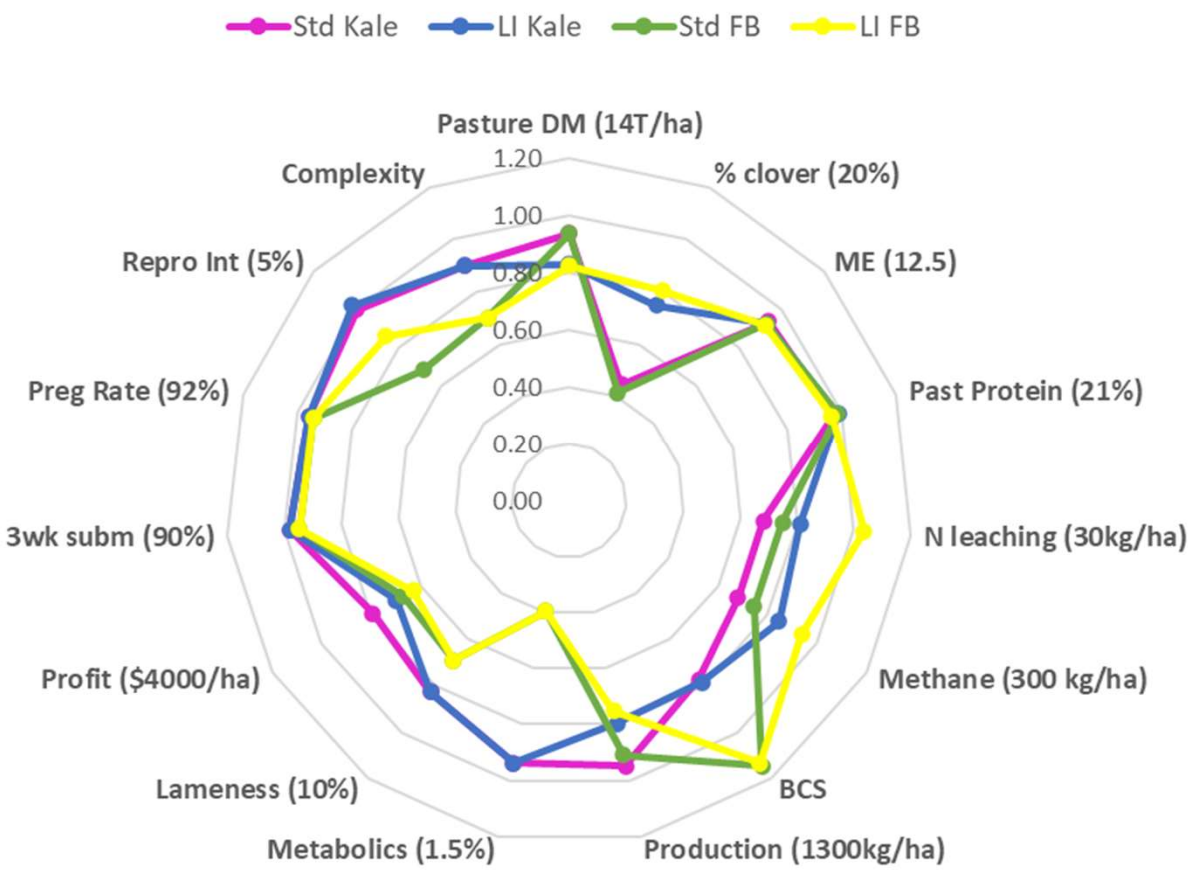
More income from kale farmlets

- Better milk solids production per ha and per cow
- Higher stock sales

Higher costs in fodder beet systems

- Animal health
- Supplementary feed
- Cropping
- Staff

The winning system depends on the metrics used to assess performance



What's next

- Continuing to optimize the fodder beet system
- Investigating baleage wintering
- Assessing wintering infrastructure options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