Virtual Field day Winter 2020

- Dawn Dalley, Nicole Hammond, Louise Cook, Charlie McGregor and the farm & tech teams

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Update from farm manager
Charlie McGregor

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Research at SDH
Core = Farm systems comparison

- FodderBeet & +/- Nitrogen

- Kale & +/- Nitrogen

Farm systems platform enables much more research

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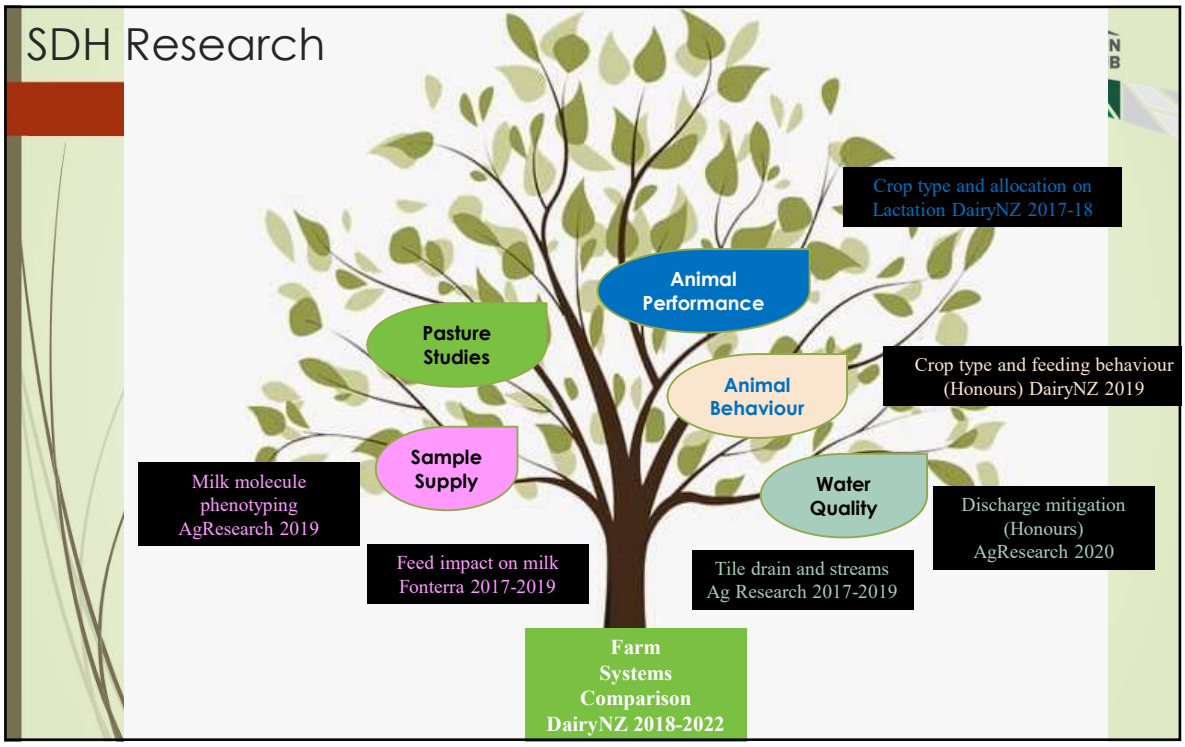
SDH Research
Crop type and allocation on Lactation DairyNZ 2017-18
Animal Performance
Pasture Studies
Crop type and feeding behaviour (Honours) DairyNZ 2019
Animal Behaviour
Sample Supply
Milk molecule phenotyping AgResearch 2019
Water Quality
Discharge mitigation (Honours) AgResearch 2020
Feed impact on milk Fonterra 2017-2019
Tile drain and streams Ag Research 2017-2019
Farm Systems Comparison DairyNZ 2018-2022

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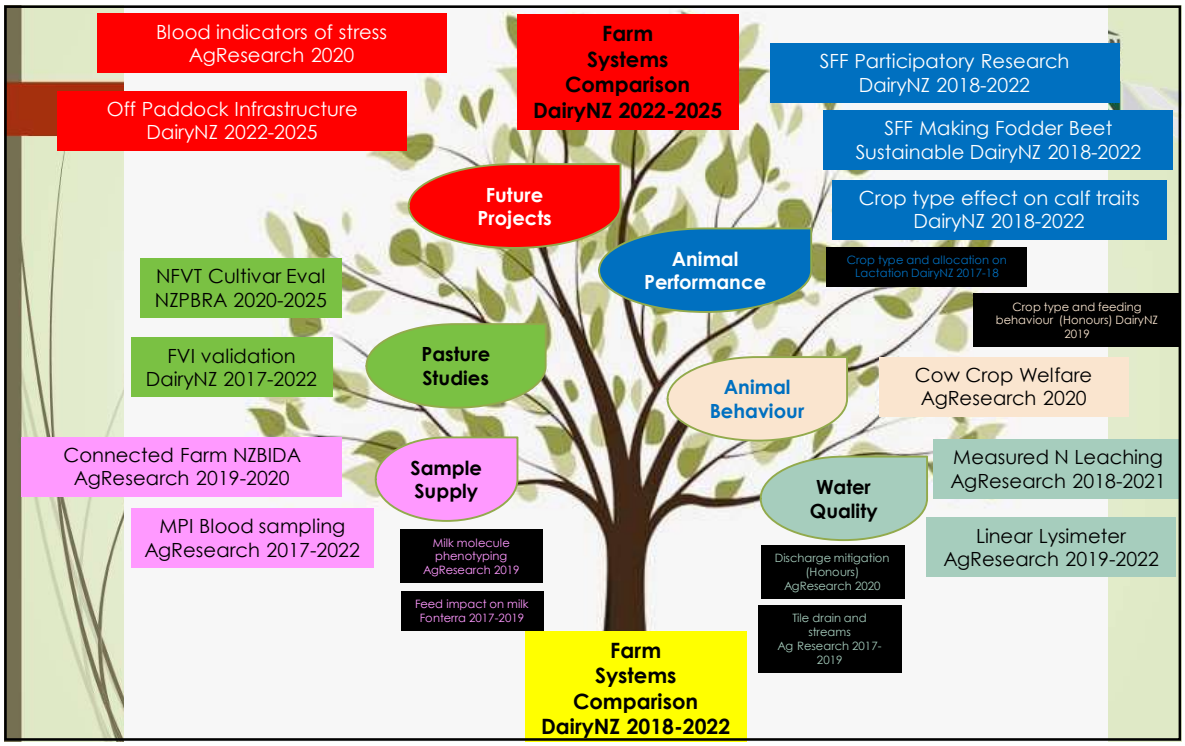
Blood indicators of stress AgResearch 2020
Farm Systems Comparison DairyNZ 2022-2025
SFF Participatory Research DairyNZ 2018-2022
Off Paddock Infrastructure DairyNZ 2022-2025
SFF Making Fodder Beet Sustainable DairyNZ 2018-2022
Future Projects
Crop type effect on calf traits DairyNZ 2018-2022
Animal Performance
Crop type and allocation on Lactation DairyNZ 2017-18
NFVT Cultivar Eval NZPBRA 2020-2025
Crop type and feeding behaviour (Honours) DairyNZ 2019
FVI validation DairyNZ 2017-2022
Pasture Studies
Animal Behaviour
Cow Crop Welfare AgResearch 2020
Connected Farm NZBIDA AgResearch 2019-2020
Sample Supply
Water Quality
Measured N Leaching AgResearch 2018-2021
MPI Blood sampling AgResearch 2017-2022
Milk molecule phenotyping AgResearch 2019
Linear Lysimeter AgResearch 2019-2022
Discharge mitigation (Honours) AgResearch 2020
Feed impact on milk Fonterra 2017-2019
Tile drain and streams Ag Research 2017-2019
Farm Systems Comparison DairyNZ 2018-2022

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Cow behaviour and soil conditions

farmer friendly visuals linking soil conditions and lying behaviour




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Cumulative effects of fodder beet – which calves are bigger?




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Calves born to fodder beet dams are lighter, shorter & have a smaller girth

	Weight (kg)	Height (cm)	Length (cm)	Girth (cm)
2018 heifers	-9%	-2%	-1%	-3%
2019 heifers	-9%	-3%	-3%	-4%
2019 bulls	-5%	-4%	-3%	-2%

- Implications for bone health
- Measurements are ongoing until the end of the first lactation for 2017, 2018 and 2019 born replacements

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Understanding system nitrogen dynamics






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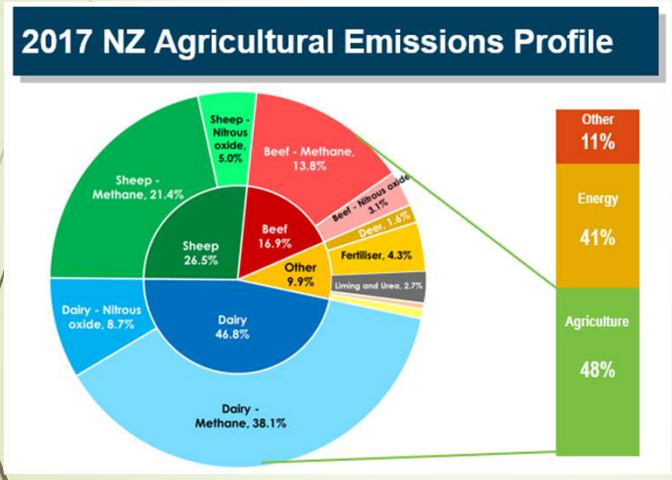
Understanding system greenhouse gas emissions



- Measuring DM intake
- Assessing feed quality
- Calculating N surplus

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3 years on – what do we know?

- More conservative pasture growth and milk production estimates for a new conversion would be sensible
- Old Southland sheep farms need a lot of recovery drainage maintenance. And thistle control. And Ragwort control. And Dock control
- Research farms are NOT normal farms, they are complex, and require exceptional people.
- Research answers require patience like a fancy shampoo. It won't happen overnight, but it will happen!

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3 years on – what have we confirmed?

- It is harder to put BCS on cows grazing kale over winter than fodder beet
- Meeting crude protein requirements of animals grazing fodder beet in winter is difficult, especially R1's
- Supplementing phosphorus during winter on crop is challenging but is required reliably to meet animal requirements
- Fodder beet systems are more susceptible to poor mineral nutrition management than kale systems
- Fodder beet wintering produces smaller calves
- Gains through pasture breeding have resulted in new ryegrass cultivars being far superior in heading management
- Pasture clover content is responsive to lower N fertilizer inputs

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3 years on – what have we confirmed?

- Fodder beet yield can be highly variable, and it is more susceptible to poor soil preparation and growing conditions and doesn't like wet feet!!
- Nitrate leaching losses are greater from autumn grazed fodder beet than winter grazed fodder beet
- Lifting fodder beet in autumn did not reduce losses
- Nitrate leaching losses are greater from winter grazed kale than winter grazed fodder beet
- Measured nitrate leaching losses from pasture are similar to Overseer predicted losses

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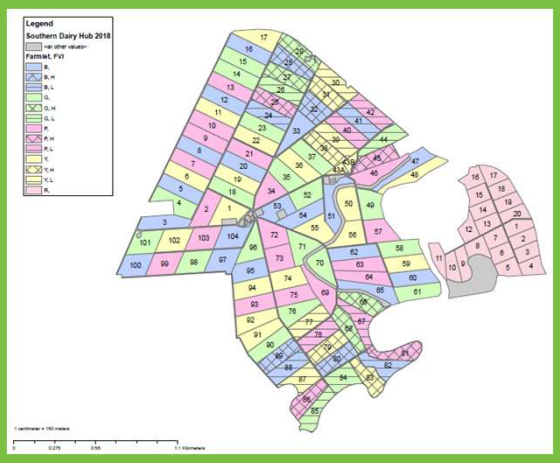
Farm System performance summary 2019-20



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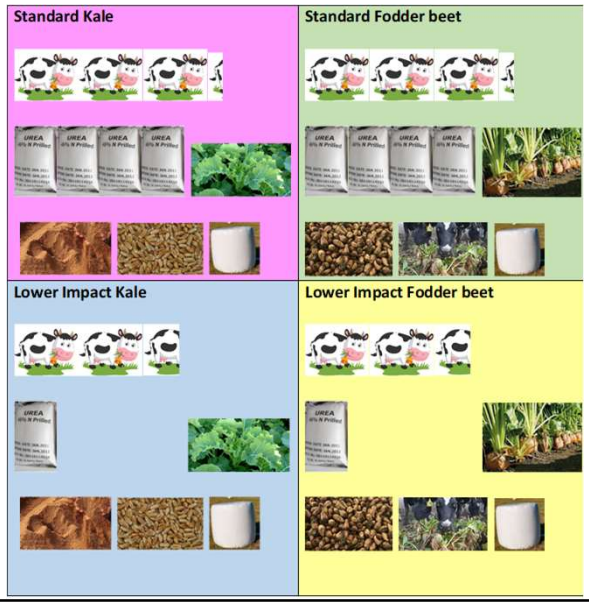
Farm systems recap



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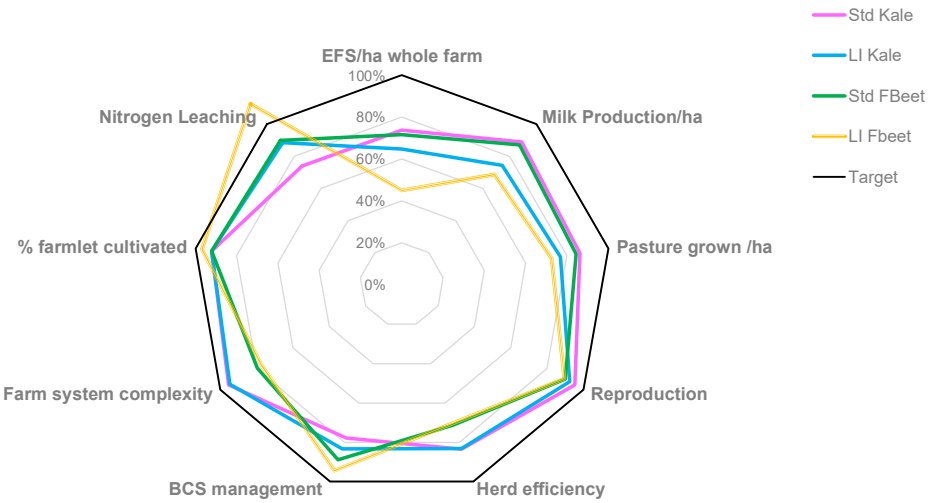
Wagon wheel



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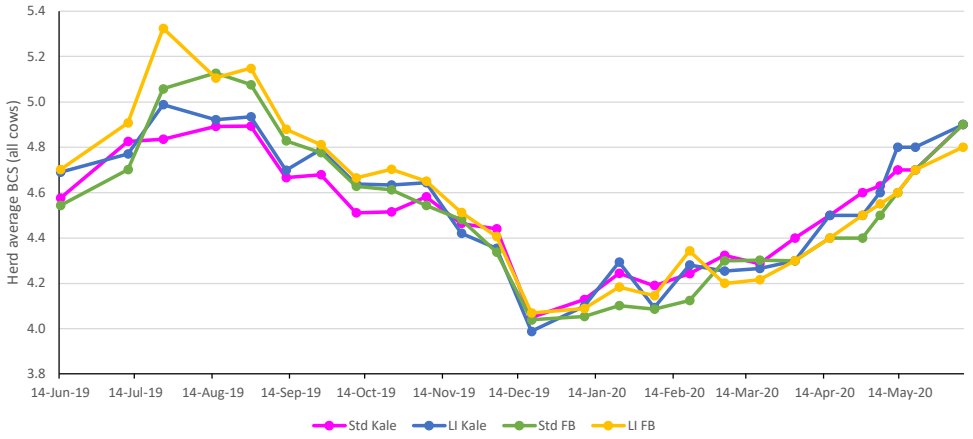
In 2019 cows wintered on fodder beet calved in better BCS than those wintered on kale



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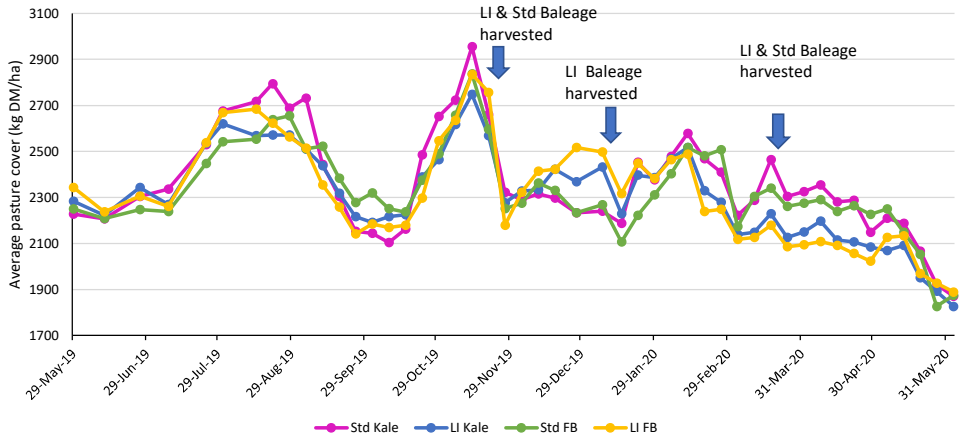
LI farmlets APC was higher in early summer but lower through autumn



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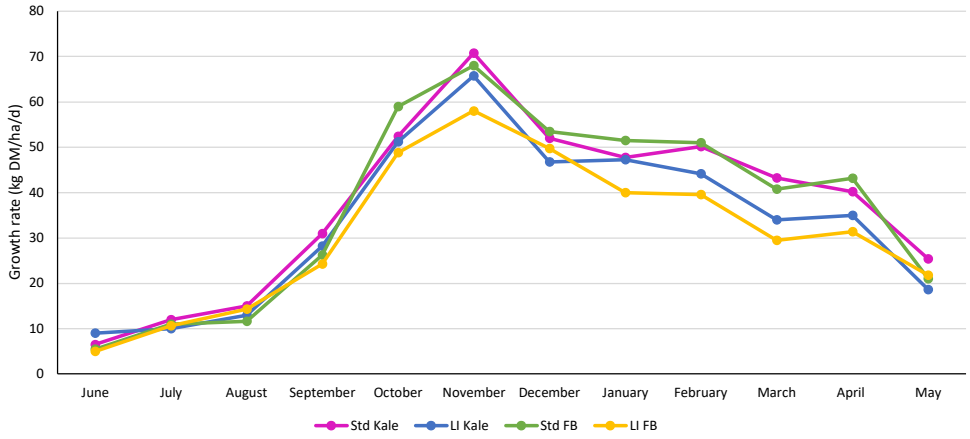
Similar average pasture growth rates until September then LI farmlets lower



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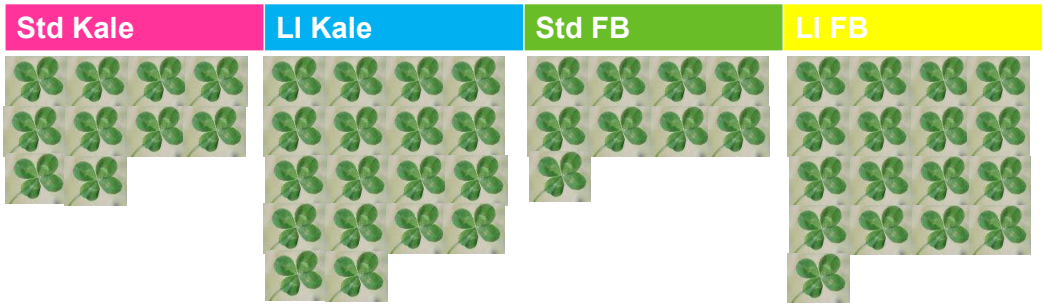
More clover in LI systems



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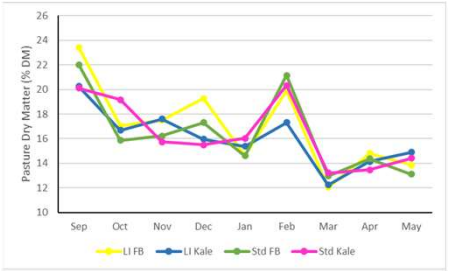
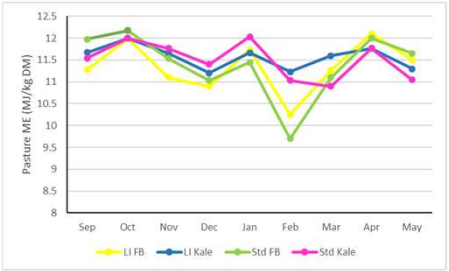
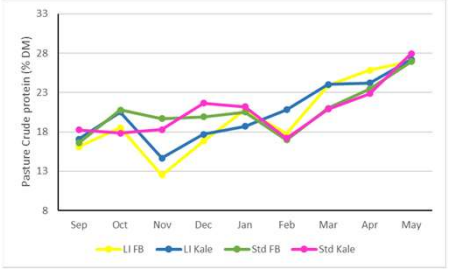
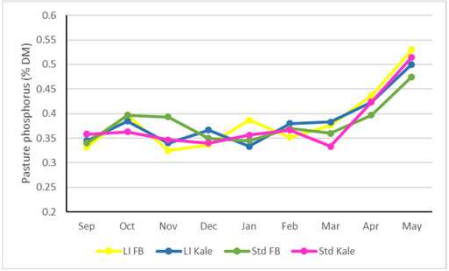
No consistent trends in pasture quality









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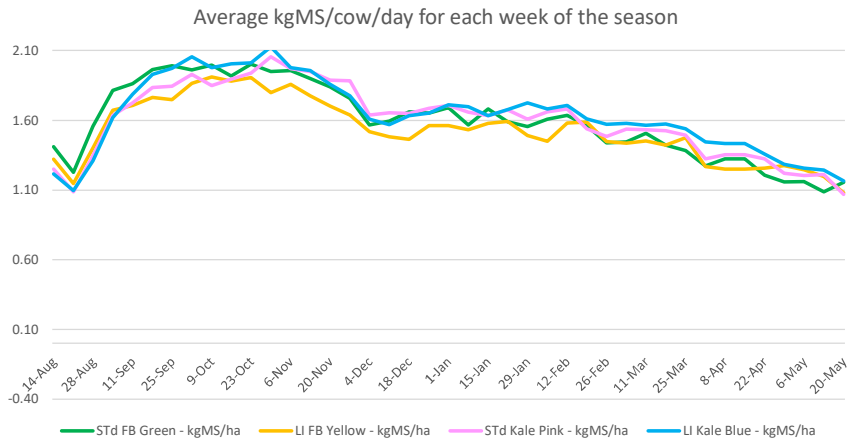
Later peak production for kale herds; Lower peak production for LI FB herd



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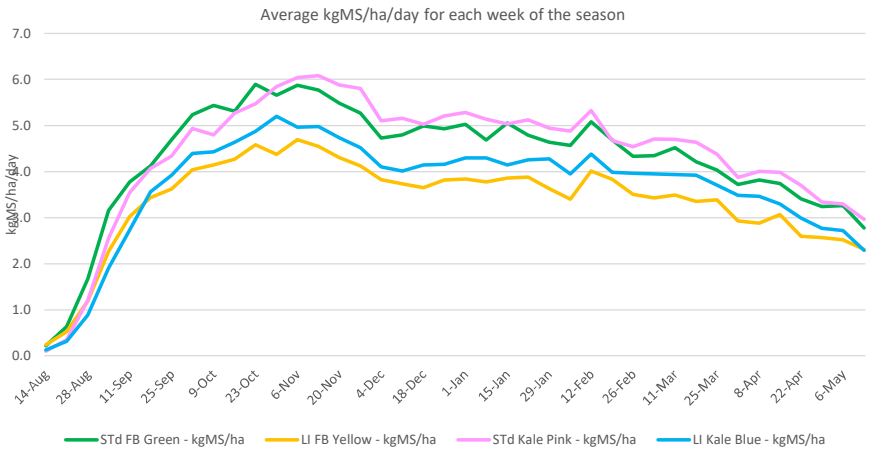
Significant effect of stocking rate & crop type on per hectare production



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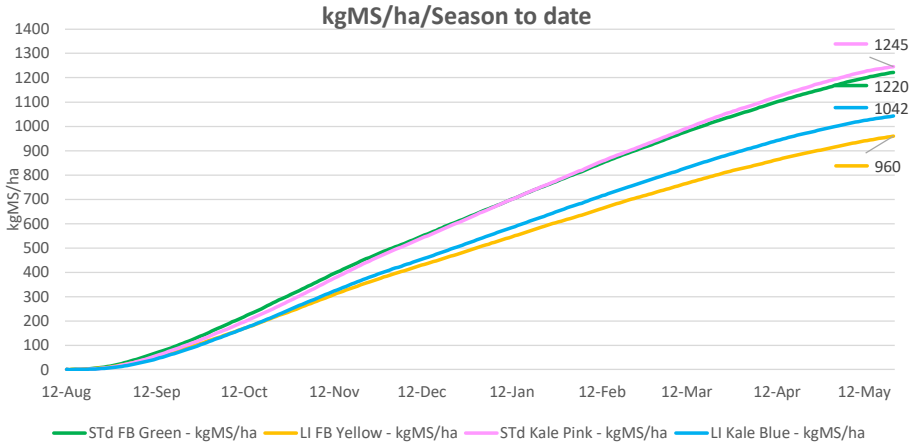
Similar cumulative MS production for Std farmlets, lower for LI farmlets, esp. LI FB



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Reproduction summary

	STD Kale	LI Kale	STD FBeet	LI FBeet
% CIDR	5%	4%	6%	6%
% 3wk Sub rate	81%	88%	77%	80%
% 6 wk IC rate	73%	69%	71%	70%
Scanned MT rate (cows on farm)	9%	12%	14%	13%
Not in-calf rate (repro status unknown, culled prior to scanning)	10%	14%	14%	15%

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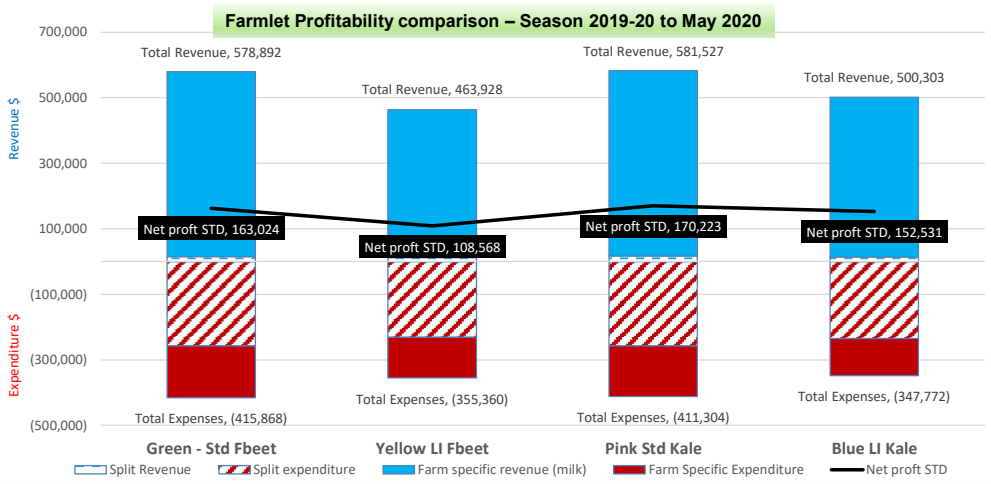
Highest net profit season to date from Std FB system



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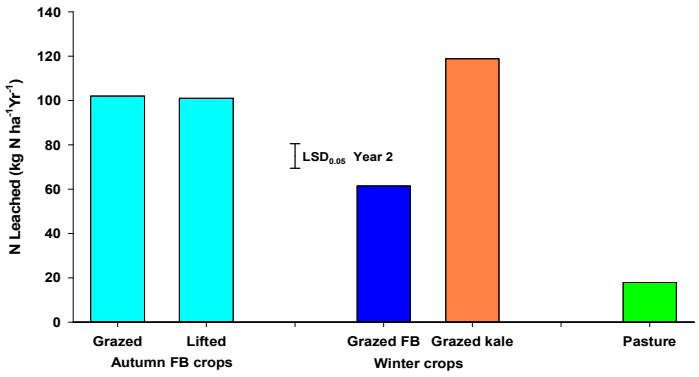
Lower nitrate leaching from winter grazed fodder beet

Average of 2 years drainage data



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N leached per cow wintered was 60% less with fodder beet feeding

	Kale	Fodder beet
kg N leached / ha	119	62
kg N leached / cow wintered	5.9	2.3

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Future farm systems questions

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SOUTHERN DAIRY DEVELOPMENT TRUST

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