Overseer
Farm Summary Report

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Printed by: Antoinette Archer

LINCOLN UNIVERSITY - DAIRY FARM

1505 Shands Rd, Lincoln 7674, New Zealand

Year ending 2024

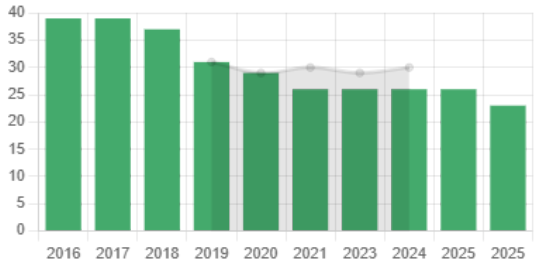
Analysis type	Year end
Model version	6.5.9

Farm map

Farm trends

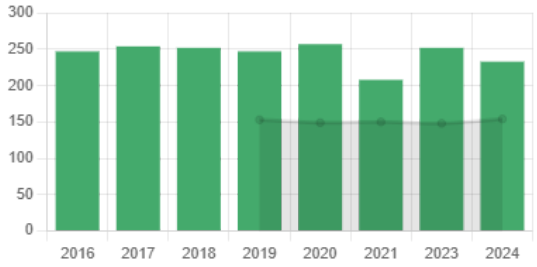
The farm value represents the farms Year End analyses results for each year. The median value represents the current mid-point of the data from Year End analyses in the OverseerFM database.

N loss (kg/ha)



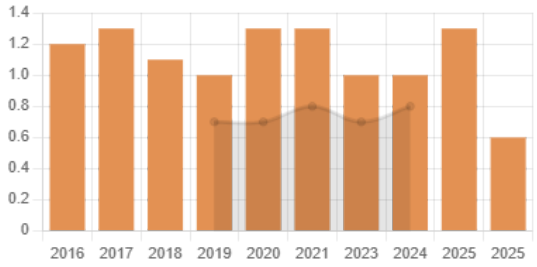
Year	Farm	Median
2016	39	
2017	39	
2018	37	
2019	31	31
2020	29	29
2021	26	30
2023	26	29
2024	26	30
2025	26	
2025	23	

N surplus (kg/ha)



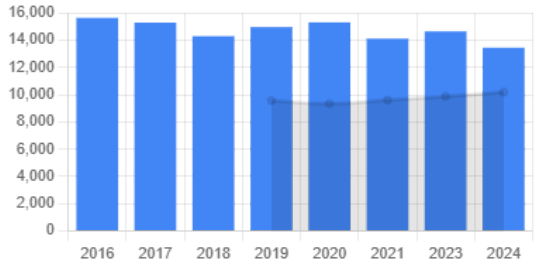
Year	Farm	Median
2016	247	
2017	254	
2018	252	
2019	247	153
2020	257	149
2021	208	150
2023	252	148
2024	233	154

P loss (kg/ha)



Year	Farm	Median
2016	1.2	
2017	1.3	
2018	1.1	
2019	1	0.7
2020	1.3	0.7
2021	1.3	0.8
2023	1	0.7
2024	1	0.8
2025	1.3	
2025	0.6	

GHG (kg CO2e/ha)



Year	Farm	Median
2016	15,640	
2017	15,289	
2018	14,294	
2019	14,963	9,557
2020	15,308	9,332
2021	14,116	9,598
2023	14,648	9,866
2024	13,449	10,181

Greenhouse gas emissions

	Year ending 2024
Total GHG emissions (t CO2e)	2,501.5
Methane (t CO2e)	1,685.5
Nitrous oxide (t CO2e)	526.4
Carbon dioxide (t CO2e)	289.6

CO2e footprint

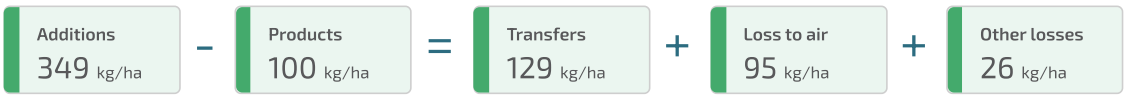
	Year ending 2024
Dairy (kg/cow)	4,493

Nutrients

		Year ending 2024
Nitrogen	Total loss (kg N)	4,840
	Average loss (kg N/ha)	26
	NCE (%)	33
	N Surplus (kg N/ha)	233
Phosphorus	Total loss (kg P)	178
	Average loss (kg P/ha)	1.0
	P Surplus (kg P/ha)	18

Nitrogen

Nutrients are brought onto the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the nitrogen surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.



1 - Nitrogen surplus is total additions minus product removed (249 kg/ha)
2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

Nitrogen brought onto farm

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

Additions (kg/ha)		Year ending 2024
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.'	169
Irrigation	Nutrients from irrigation. Nutrient concentration is defined for each system.	11
Supplements	Nutrients from supplements imported onto the farm.	32
Rain/clover fixation	Nutrients from rainfall and fixation of atmospheric nitrogen by legumes/clover.	137
Total		349

Nitrogen removed as product

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

Products (kg/ha)		Year ending 2024
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	100
Total		100

Transfer of nutrients

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/from storage.

Transfers (kg/ha)		Year ending 2024
Organic pool	Minerialisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised, the number is negative.	113
Change in supplement storage	Change in nutrients in supplements that are stored.	16
Total		129

Nitrogen lost to the atmosphere

The nutrients lost into the atmosphere through volatilisation and denitrification.

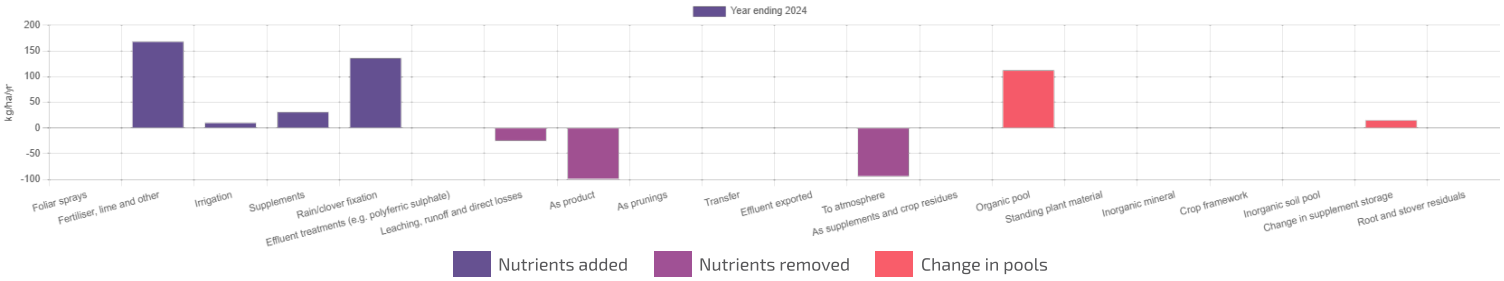
Loss to air (kg/ha)		Year ending 2024
Denitrification - background	Background conversion of nitrate to nitrogen gas.	2
Volatilisation - other	Background loss of nitrogen to the atmosphere as ammonia.	10
Volatilisation - urine	Loss of nitrogen in urine to the atmosphere as ammonia.	65
Denitrification - urine	Conversion of nitrate from urine to nitrogen gas.	10
Volatilisation - fertiliser	Loss of nitrogen in fertiliser to the atmosphere as ammonia.	8
Total		95

Other Nitrogen lost from the farm

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

Other losses (kg/ha)		Year ending 2024
Leaching - urine patches	Nutrients from urine that has leached below the root zone.	22
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	4
Total		26

Nitrogen movements



Phosphorus

Nutrients are brought onto the farm and taken up by plants that are eaten by animals. Animals move around the farm and deposit nutrients in the form of urine and dung. Nutrients are removed in the form of products (meat, crops and milk). The difference between the nutrients added and products removed is the phosphorus surplus. Remaining nutrients undergo various biological processes, are lost to the atmosphere and when drainage occurs may leach or runoff from the farm.

Additions		Products		Transfers		Other losses
37.0 kg/ha	-	17.0 kg/ha	=	18.0 kg/ha	+	0.9 kg/ha

1 - Phosphorus surplus is total additions minus product removed (20 kg/ha)
2 - The numbers in the nutrient budget have been rounded and so may not balance exactly

Phosphorus brought onto farm

Nutrients added to the farm via supplements, climate, fertiliser and effluent.

Additions (kg/ha)		Year ending 2024
Fertiliser, lime and other	Nutrients added to the farm in fertiliser. Includes synthetic, organic, lime and imported pig/dairy effluent.'	31.0
Supplements	Nutrients from supplements imported onto the farm.	6.0
Total		37.0

Phosphorus removed as product

Nutrients removed from the farm as product and as supplements. The difference between this and nutrients added is then susceptible to leaching or runoff from the farm.

Products (kg/ha)		Year ending 2024
As product	Nutrients leaving the farm as product (crops, milk, meat etc.).	17.0
Total		17.0

Transfer of nutrients

The biological processes that change nutrients available on farm. These nutrients are not taken up by plants and so are removed from the nutrient pool. Also includes the balance of the nutrients in supplements that are transferred to/from storage.

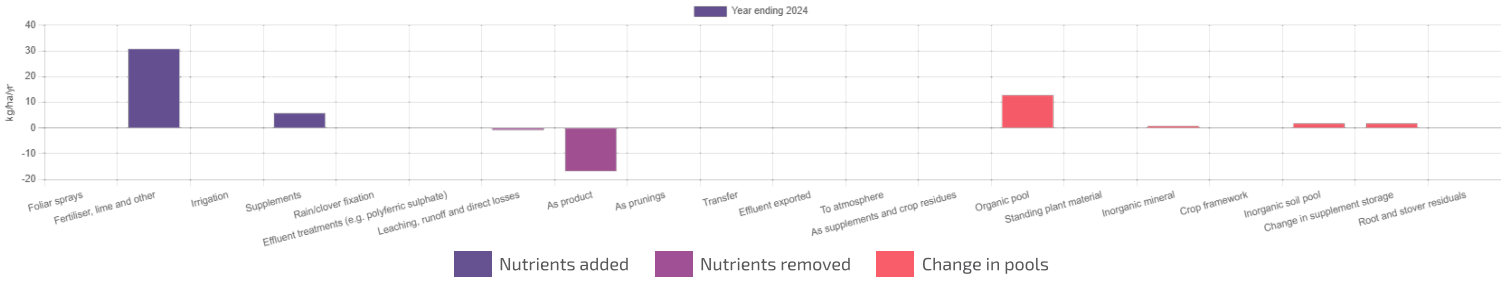
Transfers (kg/ha)		Year ending 2024
Organic pool	Minerialisation plus immobilisation. Mineralisation (decomposing organic nutrients from cultivation of crops) adds nutrients and so is a negative number, immobilisation (nutrients taken up by soil organisms) removes nutrients and so is positive. If more is mineralised than immobilised, the number is negative.	13.0
Inorganic mineral	Nutrients adsorbed on (adhered to) clay minerals and undissolved lime.	1.0
Inorganic soil pool	Change in plant available nutrients based on soil tests.	2.0
Change in supplement storage	Change in nutrients in supplements that are stored.	2.0
Total		18.0

Other Phosphorus lost from the farm

The nutrients lost from runoff, leaching or directly into water. This is where the excess nutrients runoff or drain from the farm due to water movement (drainage), or are deposited directly into water ways.

Other losses (kg/ha)		Year ending 2024
Runoff	Nutrients lossed during runoff (over land).	0.4
Leaching - other	Nutrients from other sources (not urine) that has leached below the root zone.	0.5
Total		0.9

Phosphorus movements



Physical characteristics

		Year ending 2024
Land area	Total farm area (ha)	186.5
	Productive block area (ha)	175.5
	Total grazing area (ha)	175.5
	Dairy grazing area (ha)	175.6
Climate	Average temperature (°C)	12.1
	Average rainfall (mm/yr)	606
	Average PET (mm/yr)	923
Soil	Average PAW at 60cm (mm)	108

Farm soils

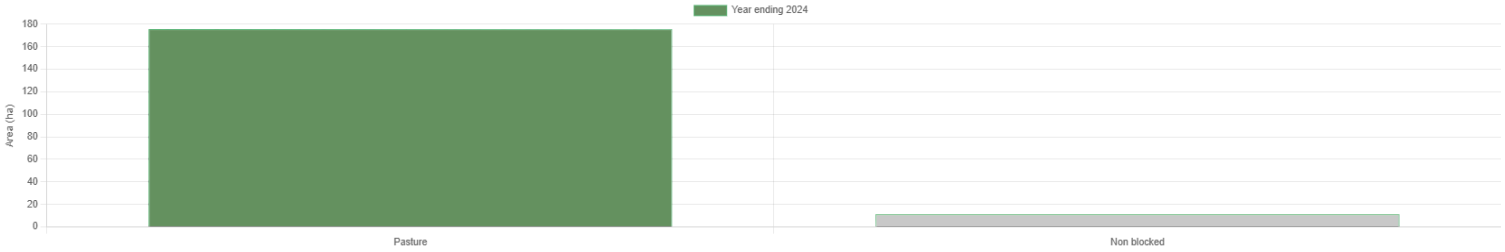
		Year ending 2024
Recent/YGE/BGE/Pallic Barr_5a.1	Area (ha)	14.3
	Properties modified	No
Recent/YGE/BGE/Pallic Temp_1a.1	Area (ha)	42.5
	Properties modified	No
Recent/YGE/BGE/Pallic Temp_2a.1	Area (ha)	8.7
	Properties modified	No
Recent/YGE/BGE/Pallic Temp_3a.1	Area (ha)	3.2
	Properties modified	No
Recent/YGE/BGE/Pallic Temp_4a.1	Area (ha)	5.5
	Properties modified	No
Recent/YGE/BGE/Pallic Waka_1a.1	Area (ha)	28.3
	Properties modified	No
Recent/YGE/BGE/Pallic Waka_3a.1	Area (ha)	34.1
	Properties modified	No
Sedimentary/Gley Flax_4a.1	Area (ha)	33.3
	Properties modified	No
Sedimentary/Gley Temu_18a.1	Area (ha)	5.6
	Properties modified	No

1 - Olsen P is calculated using soil test results, proportioned by the area of the farm that this soil covers.

Block types

		Year ending 2024
Pasture	Area (ha)	175.5
	Pasture grown (t DM/yr)	3,388
	Pasture intake (t DM/yr)	2,788
	Supplements harvested (t DM/yr)	88
Non blocked	Area (ha)	11.0
Total area	(ha)	186.5

Effective area by block type



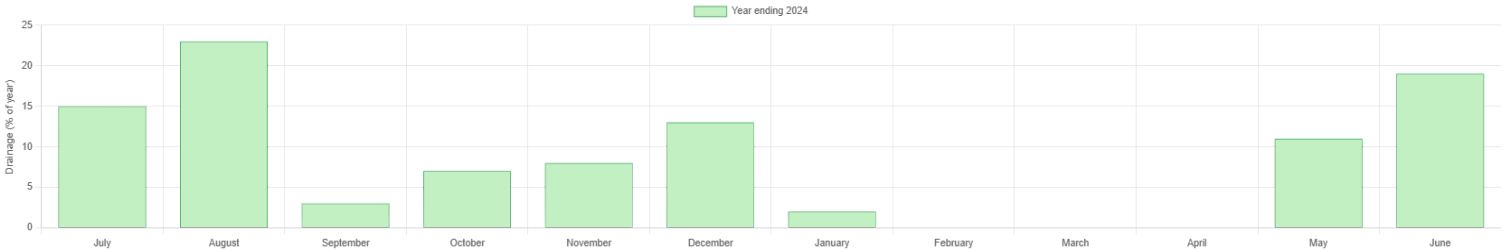
Drainage

Drainage indicates the amount of water draining below the root zome of typical crops or pastures (60cm). Drainage occurs when the amount of water (from rainfall and irrigation) exceeds the water holding capacity of the soil. When water drains it can take any excess nitrogen below this root zome and so risks leaching from the farm into the water table below.

The model uses a 30 year average climate for each block's location. The following graph shows the percentage of annual drainage that occurs each month using this average climate. This provides an indication of when the highest leaching risk is for the farm when under average conditions.

		Year ending 2024
Drainage	Average drainage at 60cm (mm)	207
	Nitrogen concentration in water drained (ppm)	13.6

When drainage at 60cm occurs



There is no wetland information for this analysis

Crops

		Year ending 2024
Ryegrass/white clover	Area (ha)	175.5
	Pasture grown (t DM/yr)	3,388
	Pasture intake (t DM/yr)	2,788
	Supplements (t DM/yr)	88

Animals

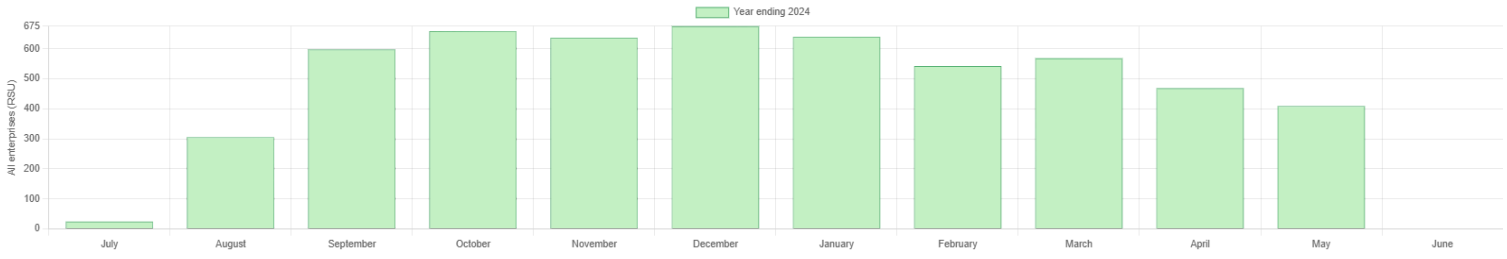
		Year ending 2024
All enterprises	Total RSU (RSU)	5,523
	Diet from pasture (%)	91.1
	Time on pasture (%)	100.0
	Total liveweight brought (kg/ha)	326
	Total liveweight reared (kg/ha)	220
	Total liveweight sold (kg/ha)	525
Dairy	Peak cows (maximum numbers)	567
	Milk solids (kg MS)	261,894
	Milk solids per cow (kg MS/cow)	461.9
	Milk solids per hectare (total farm area) (kg MS/ha)	1,404.0
	Milk solids per hectare (total grazing area) (kg MS/ha)	1,491.0
	Milk solids per hectare (dairy grazing area) (kg MS/ha)	1,491.0
	Milk volume yield (L milk)	2,964,640
	Milk volume yield per cow (L milk/cow)	5,228.6
	Cows per hectare (total farm area) (cows/ha)	3.0
	Cows per hectare (total grazing area) (cows/ha)	3.2
	Cows per hectare (dairy grazing area) (cows/ha)	3.2
Dairy grass-fed percentage	Wet matter from grass-fed feed (%)	100.0
	Time with access to pasture (%)	100.0

Enteprise RSU

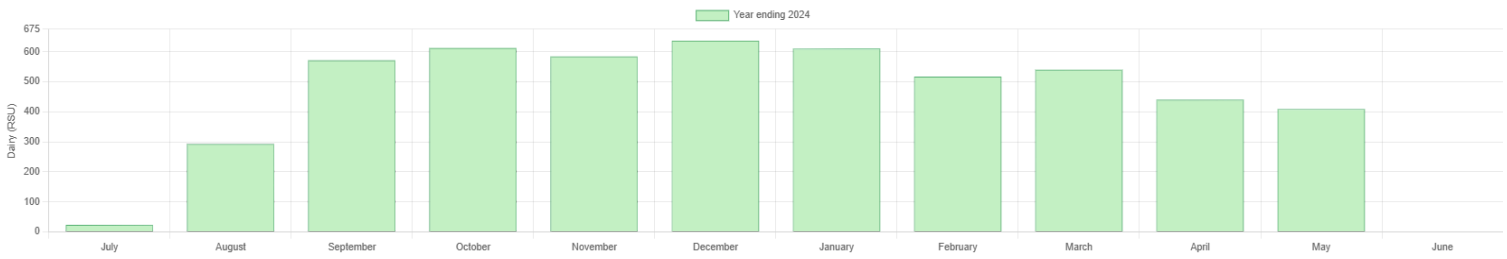
		Year ending 2024
Dairy	Total (RSU)	5,236
Dairy replacements	Total (RSU)	287

Enterprise RSU by month

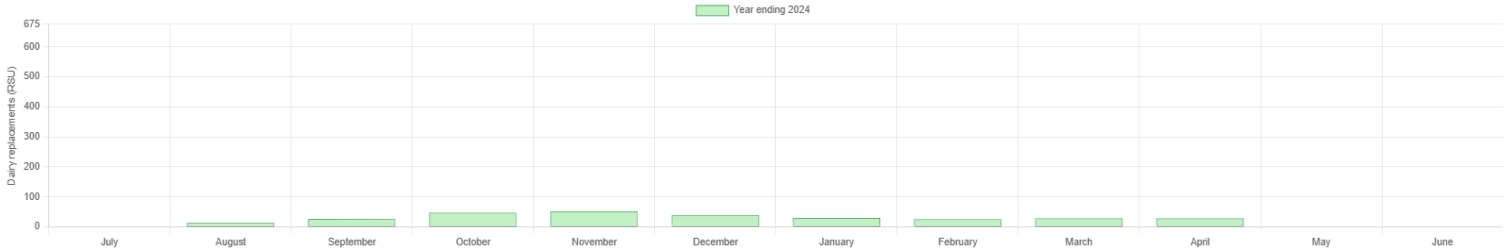
All enterprises (RSU)



Dairy (RSU)

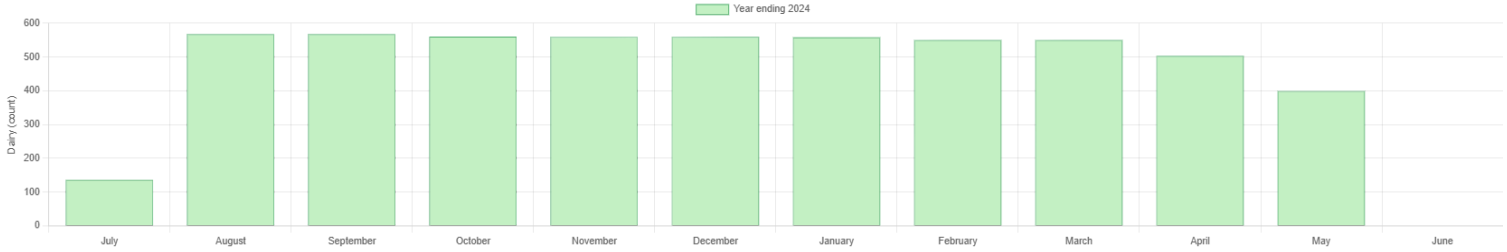


Dairy replacements (RSU)

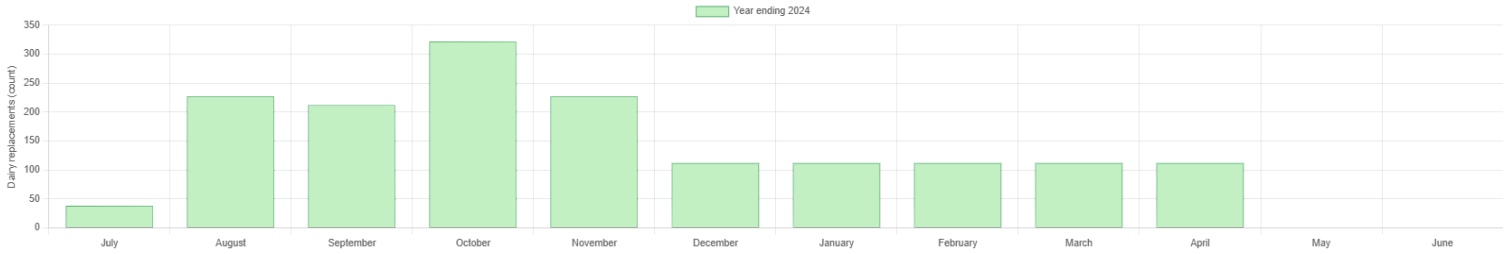


Enterprise stock numbers by month

Dairy (count)



Dairy replacements (count)

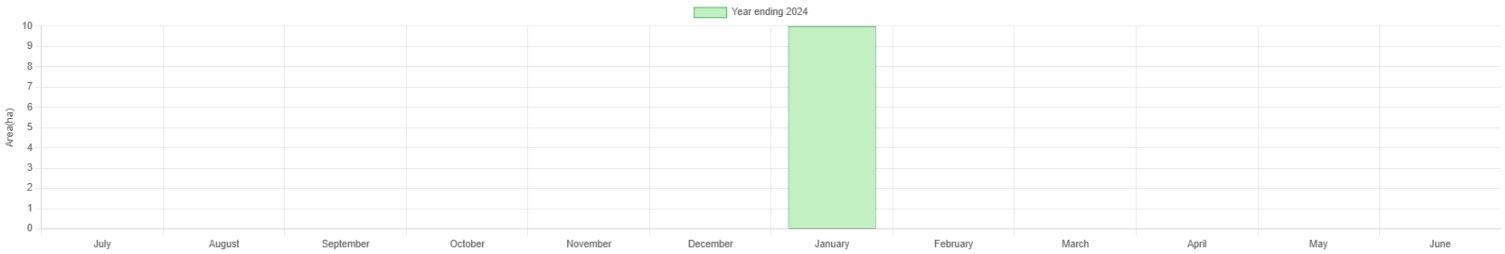


Effluent

		Year ending 2024
Area receiving liquid	Total area (ha)	64.0
	Pastoral area receiving liquid (ha)	64.0
	% of farm pastoral area (%)	36
	Average liquid effluent (N/ha/yr)	81
	Average fertiliser (N/ha/yr)	186
	Average other (N/ha/yr)	12
Source of N in effluent blocks	Effluent from farm dairy (%)	91
	Solids (%)	9
Area of farm to apply all effluent to achieve rates of	150 kg N/ha/yr - Liquid (ha)	34
	150 kg N/ha/yr - Solid (ha)	5
	150 kg N/ha/yr - Total (ha)	39
	Maintenance K (ha)	611
	100 kg K/ha/yr (ha)	59
	Maintenance K Warning (ha)	59

Effluent solids by month

Solids application area by month



Feed

		Year ending 2024
All enterprises	Total (RSU)	5,522
	Pasture (RSU)	5,029
	Imported supplements - fodder (RSU)	493

Enteprise RSU

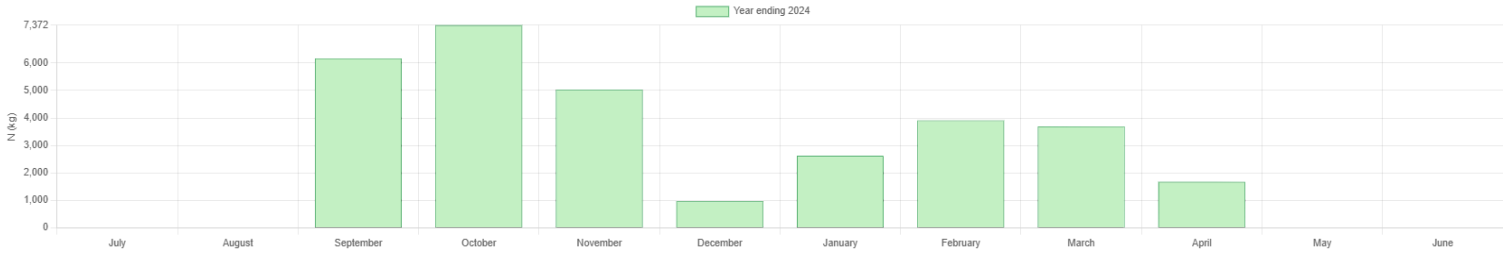
		Year ending 2024
Dairy	Total (RSU)	5,235
	Pasture (RSU)	4,742
	Imported supplements - fodder (RSU)	493
Dairy replacements	Total (RSU)	287
	Pasture (RSU)	287

Fertiliser

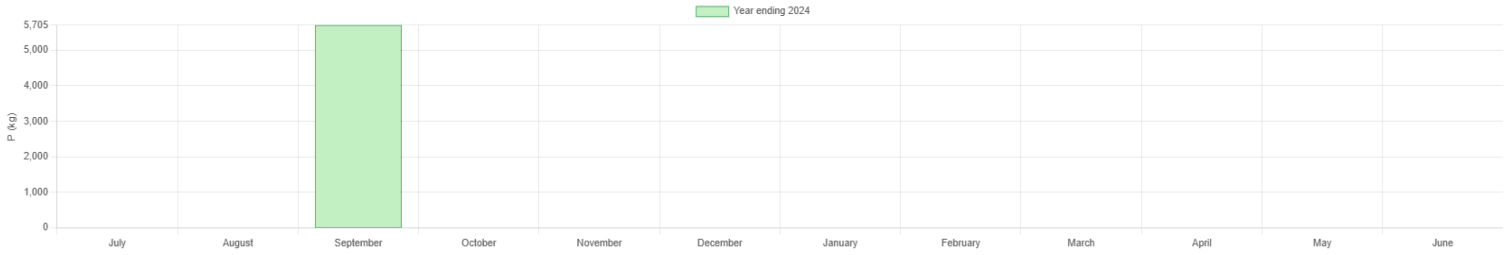
		Year ending 2024
Synthetic N	Pasture (kg)	31,441
	Pasture (kg/ha)	179
Synthetic P	Pasture (kg)	5,712
	Pasture (kg/ha)	33

Fertiliser nutrients by month

N (kg)



P (kg)



S (kg)

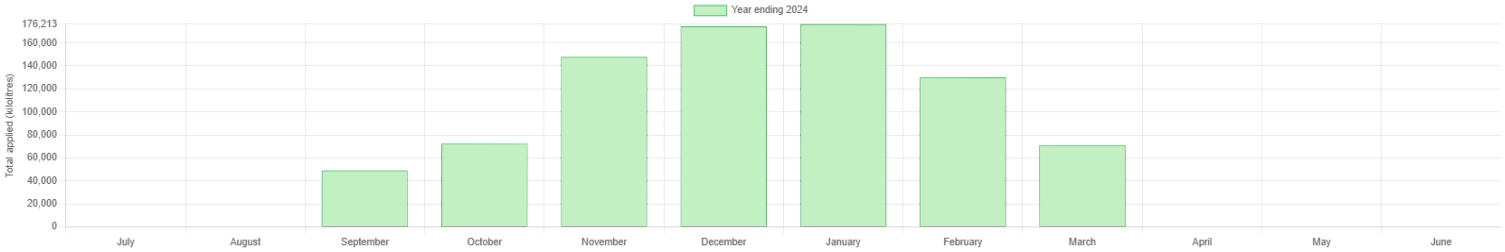
Irrigation

	Year ending 2024
Total irrigated area (ha)	175.7
Travelling irrigator (ha)	14.9
Linear and centre Pivot (ha)	116.1
Spraylines (ha)	44.7

Soil moisture assessment type usage	Year ending 2024
Fixed depth and return period; visual assessment/dig a hole (%)	75
Trigger point; fixed depth applied (%)	25

Irrigated amounts by month

Total applied (kilolitres)



Irrigated area by month