19 January 2022

Landpro Reference: 18106

Council Reference: APP-20211381

Environment Southland
Private Bag 90116
Invercargill, 9840

Dear Jade

Re: Request for Further Information under Section 92(1) of the Resource Management Act 1991 – Application for Cashmere Bay Dairies.

In reference to your request for further information dated 22nd November 2021, please find outlined below our response to this request.

1 Please provide a map of the discharge area.

Please see attached map of the discharge area.

2 Please detail the proposed rates for the umbilical and slurry tanker systems.

10mm/hr is the proposed rate for both the umbilical and slurry tanker systems.

3 Please provide any detail of nibbing on calving pad.

Gravel nibbing is present on the calving pad. The woodchip/bark base of 500mm ensures that there will be no runoff of effluent from the calving pad. This woodchip/bark soaks up any possible effluent. The woodchip/bark is replaced before it becomes saturated. It is spread as a solid waste in accordance with the permitted activity requirements of Rule 38 of the pSWLP.

0800 023 318
13 Pinot Noir Drive
PO Box 302
Cromwell 9342
Central Otago, NZ
info@landpro.co.nz
landpro.co.nz

Figure 1: Gravel nibbing around calving pad. 500mm of woodchip/bark will be put on the calving pad prior to the pad being used.

4 Please confirm the proposed max number of cows on the pad at any one time

At any one time there may be 150 cows on the pad.

5 Please confirm when the pad is to be used.

The pad is to be used in August and September and during adverse weather conditions.

6 Are the fertilizer recommendations in the modelling report adopted?

Yes.

7 Will the current and future actions proposed by the FEMP be adopted and implemented by the target dates?

Yes. A number of these have been completed please see table below.

Table 1: Actions and Proposed date.

Current Actions	Proposed date in FEMP	New Proposed date
Nitrogen – assess requirements before applying	1 Oct 2021	Completed
Calibrate Cobra Rain Gun	1 Feb 2022	1 March 2022 (to allow for back log with contractors)
Provide a winter grazing paddock plan	1 May 2022	1 May 2022
Recycle Farm Waste	1 Aug 2022	1 Aug 2022 – some already recycled. Upcoming requirement by Fonterra.
Culvert repairs	1 Aug 2023	Completed
Provide an Effluent Management Plan	1 Aug 2023	1 Aug 2023
Manage high-risk laneway areas	1 Aug 2023	Completed, along with culvert repairs.
Permanently fence/drain waterway sections	1 Sep 2023	Completed

Future Actions	Proposed date in FEMP	New Proposed date
Calibrate Pivots and Rotorainers	1 Oct 2023	1 Oct 2023 (discussions with contractors already being had so likely to be prior to this)
Develop a riparian plan	1 Jun 2024	1 Jun 2024. An informal plan has already been completed. (See appendix A)
Manage Critical Source areas	1 Aug 2024	1 Aug 2024. This is ongoing and work is currently being done/has been completed for a number of CSAs on farm.
Use spread mark accredited contractors	1 Aug 2024	Currently done.
Improve silage storage	1 Oct 2028	1 Oct 2028

8 Will the use of catch crops still be considered on an annual basis with the proposed land use change?

Yes – the applicant will continue to use catch crops on an as required/where practicable basis. The use of catch crops depends on the re-sowing ability and may not be practicable each year, and on all crop paddocks, as such these have not been included as part of the nutrient modelling.

9 Please confirm if the long term options for CSAs will be implemented and detail how each identified CSA will be managed in the long term.

The following long terms options will be implemented.

- Install drainage in paddocks 31 – 34. This work has been included in the list of upcoming work by the applicant and is planned to be completed by June 2023.
- Extend riparian margins where overland flow from Critical Source Areas enters waterways. It is planned to widen the riparian margins in Paddocks 4 & 13. Future riparian planting is detailed in the attached Riparian Plan and includes planting along the main waterway of the property, running from paddock 52 to paddock 13.
- The CSA identified in paddock 77, the blocked tile drain, has been fixed and this is no longer an issue.
- Paddock 76 will continue to be temporarily fenced off and stock excluded when wet as detailed in the FEMP. Future options will be looked at if necessary and will be detailed in future FEMPs, currently this area is not as high of a priority as other areas on farm as the risk is very low.

10 Future Riparian Planting Plan

Please see attached future riparian planting plan. The timing of this planting will be a staged approach and will be detailed in future iterations of the FEMP although is planned to be completed by 2025.

11 Is there to be further riparian planting of the pond/wetland area in paddock 69?

No. This area has been fenced and has naturally rejuvenated into red tussock, therefore future planting is deemed unnecessary at this stage and there are other areas of the farm where the applicant wishes to focus attention on with regards to further riparian planting. Figures 2, 3 and 4 below show this area and demonstrate the plant growth, and stage of establishment. It is anticipated that these plants will naturally expand further to fill the fenced area. These figures show that significant plant growth has already occurred, meaning that further riparian planting is not needed at this stage.

Figure 2: Natural rejuvenation of red tussock around the wetland/pond area in Paddock 69.

Figure 3: Natural rejuvenation of red tucks around the wetland/pond area in Paddock 69.

Figure 4: Natural rejuvenation of red tussock around the wetland/pond in Paddock 69.

12 Will the small section on the south side of paddock 69 be incorporated into the pond/wetland area of paddock 69?

Yes, this has already been done. Please see figures above showing the extent of the area.

13 Is there to be further riparian planting in the section below paddock 63?

Yes, this is to be in a staged approach and will be outlined in future FEMPs. The applicant's current priority is to plant the area between paddocks 53 and 13 that is currently not planted, and then will come back and widen where necessary.

14 Is there to be riparian planting along the main creek (paddock 53 and 13)

Yes – the plan is to shift the existing fences and widen the riparian area and allow for further planting. This area is planned to be widened by January 2025.

15 Estimated timelines for planting

As above, the main riparian planting in the upcoming years will be between paddocks 53 and 13. This is estimated to be completed by Jan 2025. Further riparian planting on the property is planned, but will be a staged approach and will be outlined in future FEMPs.

16 Groundwater elevation concentration details.

Bore F45/0172 has in the past had elevated readings of total oxidized nitrogen. The applicant has agreed to decommission this bore as it is no longer in use.

The bore is shallow, 4.6m, compared with other bores on the property and surrounds which measure between 10-20m depth.

The domestic waste from the property to the north of F45/0172 is treated in a septic tank, located next to the main house, with a disposal field located between bore F45/0172 and the house, as shown in Figure 5 below.

As seen in this figure the disposal field is within 100m of the bore.

It is likely that due to the shallow depth of the bore, that contaminants from the disposal field are contributing to the elevated contaminant levels recorded in F45/0172.

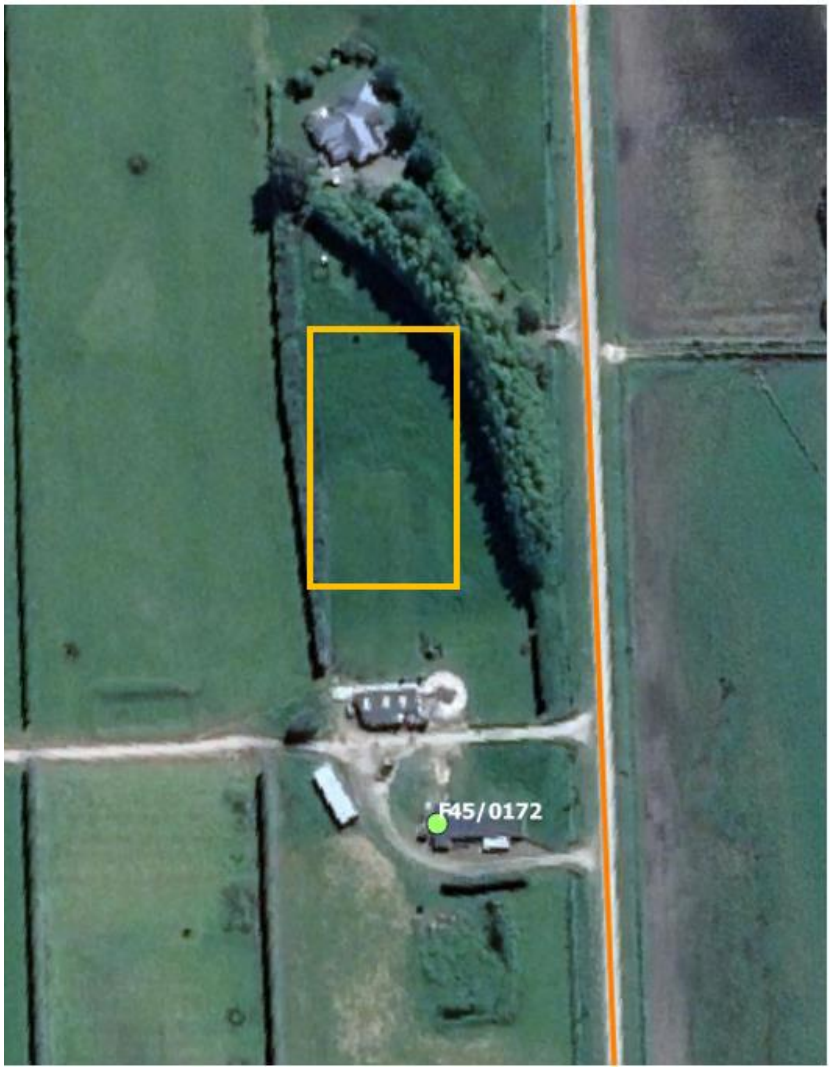


Figure 5: Disposal field (orange) in relation to F45/0172.

17 Details around fencing and riparian planting of the pond/wetland are below paddock 63 and 64.

Figure 6 below shows the area below paddock 63 in September 2018. The main waterway on the property runs in a northeast to southwest direction (right to left in the below photo), with the two laneways crossing over the waterway. The area in the northwest half of the image (to the left of the red circle), is elevated above the rest of the land. The area highlighted in red forms a CSA/swale where there is the potential for contaminants to flow via overland flow into the waterway.

Figure 6: Aerial image from September 2018. CSA shown in red. Overland flow path shown in blue.

Figure 7 below shows the same area in November 2019. The CSA highlighted above has been fenced off and left in pasture. This allows a significant vegetated buffer for contaminants, mitigating the effects of any possible overland flow entering the waterway. This can be further seen in Figure 8.

Figure 7: Aerial image from November 2019.

Figure 8: Fenced and retired area to the north of the waterway.

Significant riparian planting has occurred along the waterway between the two laneways. No aerial imagery is present post 2019 that shows this riparian planting, but the below photos demonstrate the extent of this planting. The waterway east of the main laneway is on average 20m from the laneway. This area is downgradient of the laneway and therefore, there is the possibility of contaminants from

the laneway travelling via overland flow into the waterway. This area has been planted to form a significant vegetative buffer between the laneway and the waterway.

Figure 9: Distance between the laneway and main waterway.

Figure 10: Laneway in the background, showing riparian planting between laneway and waterway.

Figure 11: Riparian planting along waterway.

At this stage, the applicant's main priority is to refence, plant and establish a vegetated buffer along the rest of the main waterway on farm from paddock 53 to paddock 14. This is likely to have further significant positive impact on contaminant loss reductions on farm, more so than further planting in the area below paddock 63. This area here has substantial buffers and riparian planting resources are better used elsewhere on farm. Once this area is completed, the applicant will widen areas below paddock 63 where necessary.

18 Discussion on how the proposed activity will affect the future state of the environment. In particular, with regard to N losses and comparison between the existing activity continuing (with required synthetic N cap) and the proposed activity occurring.

It has been suggested by Irricon (the reviewer) that the following modelling should be completed:

> ***The decrease in N applied (24.7 % in dairy support and 30% on dairy farm) could be the major reason for the decrease in N loss. It would be beneficial to look at dropping N applied (62 on support and 81 on dairy farm and replacing lost potential growth silage (76 tDM baleage for dairy support and 275 tDM for dairy farm). This would then compare the YE 2020 models with the Proposed models taking out the drop in N fertilizer factor. I could make these changes to the models to look or you could request the Applicant completes?***

A farm system is complex and interlinked, changes can not be treated in a singular manner. As an alternative to the suggestion of the reviewer, the modelling has been completed for the 20/21 season

for all blocks. The 20/21 season reflects a transition to lower nitrogen fertilizer use, as required of the NESF to reduce nitrogen fertiliser use to no more than 190 kg N/ha, thus taking into account the required reduction in nitrogen. The 20/21 season has a lower nitrogen fertilizer use reflecting the transition to the proposed system in which 189 kg N/ha will be applied, as required by the NESF.

Nitrogen usage in 20/21 has decreased from the 19/20 season as follows:	**19/20**	**20/21**	**Difference**
Average N applied on pastoral areas (kg N/ha)	265	201	-24%
Average N applied across landholding (effective area including crop) (kg N/ha)	252	197	-22%

Results from the 20/21 modelling as follows:

	Milking Platform 20/21	**Support 1 20/21**	**Support 2 20/21**	**Total**
Total Farm N loss (kg N/yr)	15,257	2,131	5,651	23,039
N Loss per ha (kg N/ha/yr)	43	24	70	
Total Farm P loss (kg P/yr	354	37	40	431
P loss her ha (kg P/ha/yr)	1	0.4	0.5	
Pasture Grown (kg DM/ha/yr	16.9	14.2	16.2	

The results from the 20/21 season compared with the 19/20 season:

Total Farm N loss (kg N/yr)	**Milking Platform**	**Support 1**	**Support 2**	**Total**
19/20	18,053	2,186	3,760	23,999
20/21	15,257	2,131	5,651	23,039
% difference				-4%

Total Farm P loss (kg P/yr)	**Milking Platform**	**Support 1**	**Support 2**	**Total**
19/20	333	32	40	405

20/21	354	37	40	431
% difference				6.4%

Overall, between the 20/21 and the 19/20 season, N loss decreased by 4% and P loss increased by 6%. Key drivers were:

- Decrease in crop area
- Decrease in nitrogen fertiliser use
- Increase in Olsen P
- Decrease in phosphate fertiliser applied

Note there was minimal change in milk production and stock numbers between the two years. As synthetic nitrogen reduces it is likely farmers are utilising nitrogen applications more strategically / efficiently. There is also more focus on biological fixation by clover plants.

At a block level the key changes between blocks related to crop areas, nitrogen use, and stock movements.

The results from the 20/21 season compared to the proposed farm system:

Total Farm N loss (kg N/yr)	**Milking Platform**	**Support 1**	**Support 2**	**Total**
20/21	15,257	2,131	5,651	23,039
Proposed Farm system	19,563	2,344	0	21,907
% difference				4.9%

Total Farm P loss (kg P/yr)	**Milking Platform**	**Support 1**	**Support 2**	**Total**
20/21	354	37	40	431
Proposed Farm system	357	27	0	384
% difference				10.9%

Overall, between the proposed farm system and the 20/21 season (that reflects a decrease in nitrogen fertilizer use), N loss decreased by 5% and P loss by 12%

Key drivers:

- Increase in cow numbers
- Removal of beef animals
- Increase in crop area

- Decrease in Olsen P
- Reduced P fertiliser use
- Reduced nitrogen fertiliser use

From the above comparison of the 20/21 season with the proposed system it is clear that the decrease in nitrogen fertilizer is not the sole driver of nutrient loss changes. With a decrease in nitrogen fertilizer, there is still a significant reduction in contaminant losses. It is important to note the complexity of farm system changes and that comparing one change in isolation will not fully explain changes to nutrient losses.

19 Assessment of the increasing N losses modelled for Support 1 block against the relevant regional plans, the NES and NPS.

It is important to note that the waterway originating on Support Block 1 travels off farm and re-enters the block at Support Block 2. It then travels through Support Block 2 and the dairy platform before meeting the main waterway of the property and exiting southwest of the property.

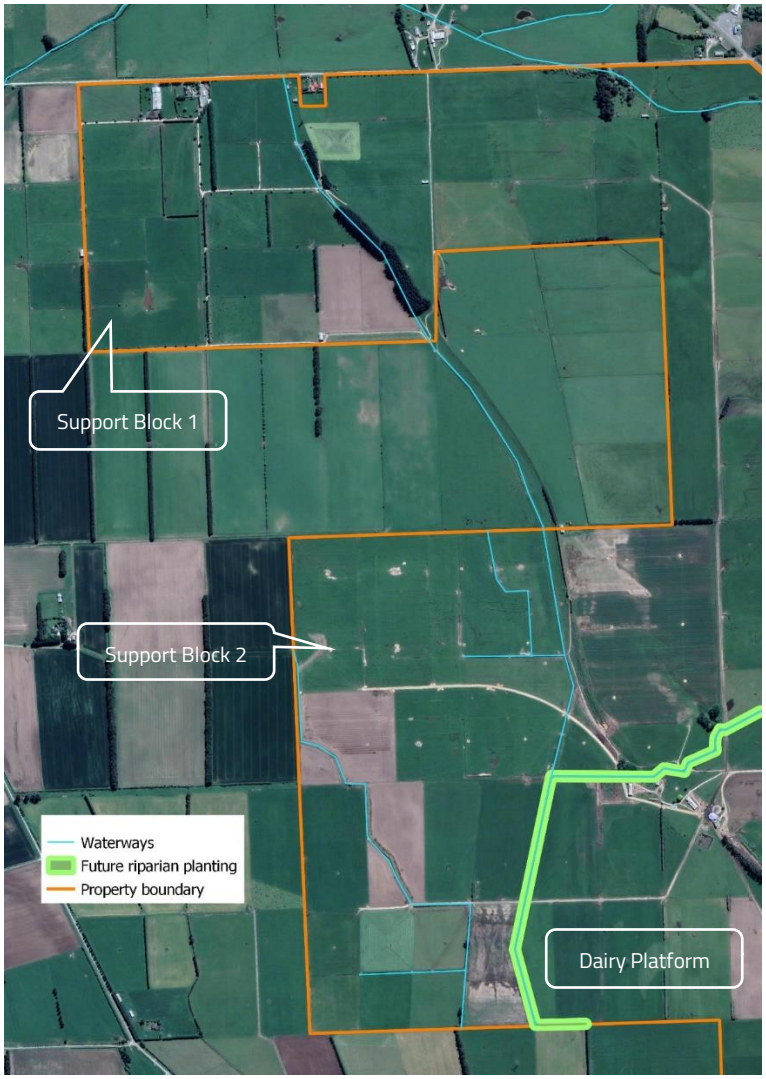


Figure 12: Waterways on Support Block 1.

Minimal effects from a possible increase in contaminants on Support Block 1 are in the same waterbody and same catchment as that on Support Block 2 and the milking platform where significant reductions in contaminants are proposed. Support Block 1 is upstream of Support Block 2 and the milking platform, indicating that a slight increase in contaminants upstream at Support Block 1 will be attenuated more than accounted for with a significant improvement 600m downstream at Support Block 2 and the dairy platform.

Breaking down Overseer results at a block level assumes a level of accuracy that Overseer does not offer. There is a 1.7 kg N/ha increase in N per year on the Support Block 1. There is a decrease in P contaminants.

For the proposed milking platform, we see a decrease of 5 kg N/ha and a further decrease in P contaminants.

The NES-FW stipulates that contaminant loads in the catchment compared with loads as at close 2 Sep 2020 must decrease. As Support Block 1 is in the same catchment as the remainder of the farm, we are seeing an improvement at a catchment level. There is no increase at a catchment level. It also stipulates that the activity must not result in an increase in concentrations of contaminants in freshwater or other receiving environments, compared with 2 Sep 2020. The waterway through Support Block 1 travels downstream through Support Block 2 and the milking platform, where a significant reduction in concentrations is being found. There is no net increase in concentration in the freshwater body or receiving environment, i.e., the main waterway travelling through the property or the Mataura River.

Similarly for both the PSWLP and NPS and improvement in waterway quality is being made in the receiving waterbodies and the catchment.

Furthermore, there is minimal opportunity for mitigation on Support Block 1 alone, but at the landholding perspective, and farm scale, and increase in contaminants on Support Block 1 are offset over the landholding, which is contained within the same catchment.

20 The application states that there is a decrease in (cow) stocking rate, however the nutrient budgets show that there is an overall increase in stocking rate (RSU) on both the proposed dairy platform and the Support Block 1, from the existing operation (dairy platform + support block 2, and support block 1, respectively) to the proposed activity. Please confirm if this is correct.

For information purposes only, RSU stands for revised stock units, and therefore is not only driven by stock units/ha, but also the energy/feed requirements of the type of stock. Therefore, a change in stock type typically results in a RSU change even if there is no increase in overs stock unit/ha. RSUs are typically useful for assessing and comparing farm carrying capacities.

The RSU increases from 13,985 to 15,030 (an increase of 7%) is driven by the increase in dairy cow numbers, and the removal of beef animals.

As covered in the original report overall nutrient loss reduction is driven by multiple factors:

- Increase in cow numbers
- Reduced nitrogen fertiliser use
- Removal of beef animals
- Reducing the farm average Olsen P to 30

21 Address the concerns regarding the Proposed model raised by the Nutrient Budget auditor in the attached Irricon review. Please note that this has been updated from the previous version sent through due to a couple of superficial corrections.

The numbers of animals wintered have increased from 1210 (1000 cows + 120 yearling heifers) in YE 2020 models to 1460 (1195 cows and 265 yearlings) in the proposed.

There are errors in the above calculation, it should read

~~1210~~ 1420 (1000 cows + ~~120~~ 210 yearling heifers + 120 yearling steers + 90 2 yr old steers) in YE 2020 models to 1460 (1195 cows and 265 yearlings) in the proposed.

How the Olsen p levels will drop allowing the P fertiliser applied slightly exceeds maintenance P requirements.

Phosphorus has been applied as per maintenance requirements:

Below in the Overseer estimated maintenance requirements for the milking platform followed by the applied – there are no differences.

Maintenance fertiliser

Check whether soil test values for the blocks are at the economic

NUTRIENTS REQUIRED (KG/HA/YR) [1]	P
MP EFFLUENT 53.1 HA	22
MP EFFLUENT 23.4 HA	20
MP EFFLUENT CENTRE PIVOT	20
MP EFFLUENT LARGE RR	21
MP EFFLUENT SMALL RR	20
MP NON EFFLUENT (LEASE)	22
MP NON EFFLUENT (LEASE) ROLLING	24
MP NON EFFLUENT 38.2 HA	22

Phosphorus summary

	TOTAL LOSS (KG)	LOSS PER HA (KG/HA)	FERTILISER (KG/HA)
MP EFFLUENT 53.1 HA	15	0.3	22
MP EFFLUENT 23.4 HA	5	0.2	20
MP EFFLUENT CENTRE PIVOT	11	0.4	20
MP EFFLUENT LARGE RR	64	0.6	21
MP EFFLUENT SMALL RR	12	0.4	20
MP NON EFFLUENT (LEASE)	15	0.2	22
MP NON EFFLUENT (LEASE) ROLLING	11	0.4	24
MP NON EFFLUENT 38.2 HA	7	0.2	22

There are also no differences between the Overseer estimated maintenance requirements and assumed applied in the Support 1 modelling.

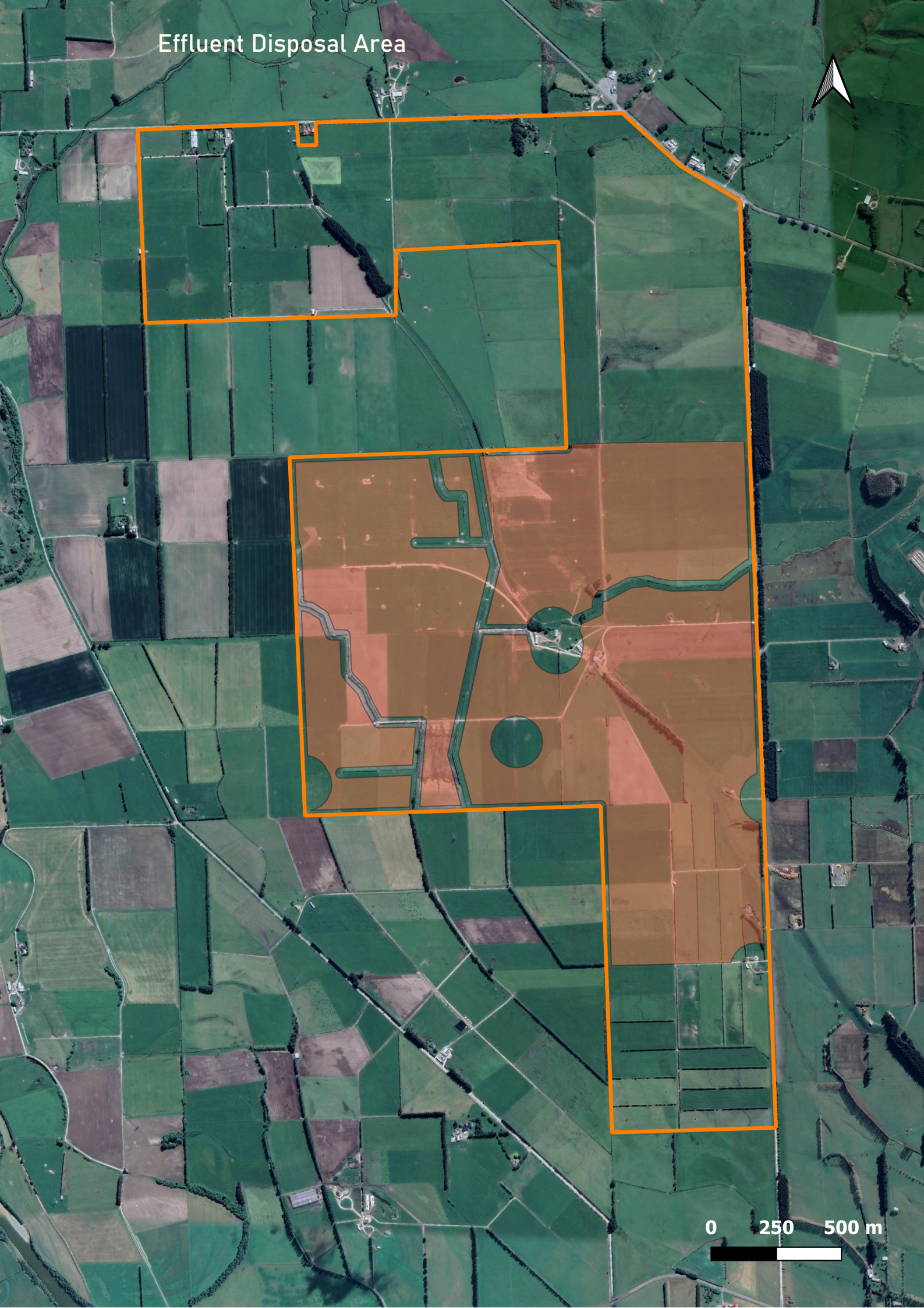
22 Summary

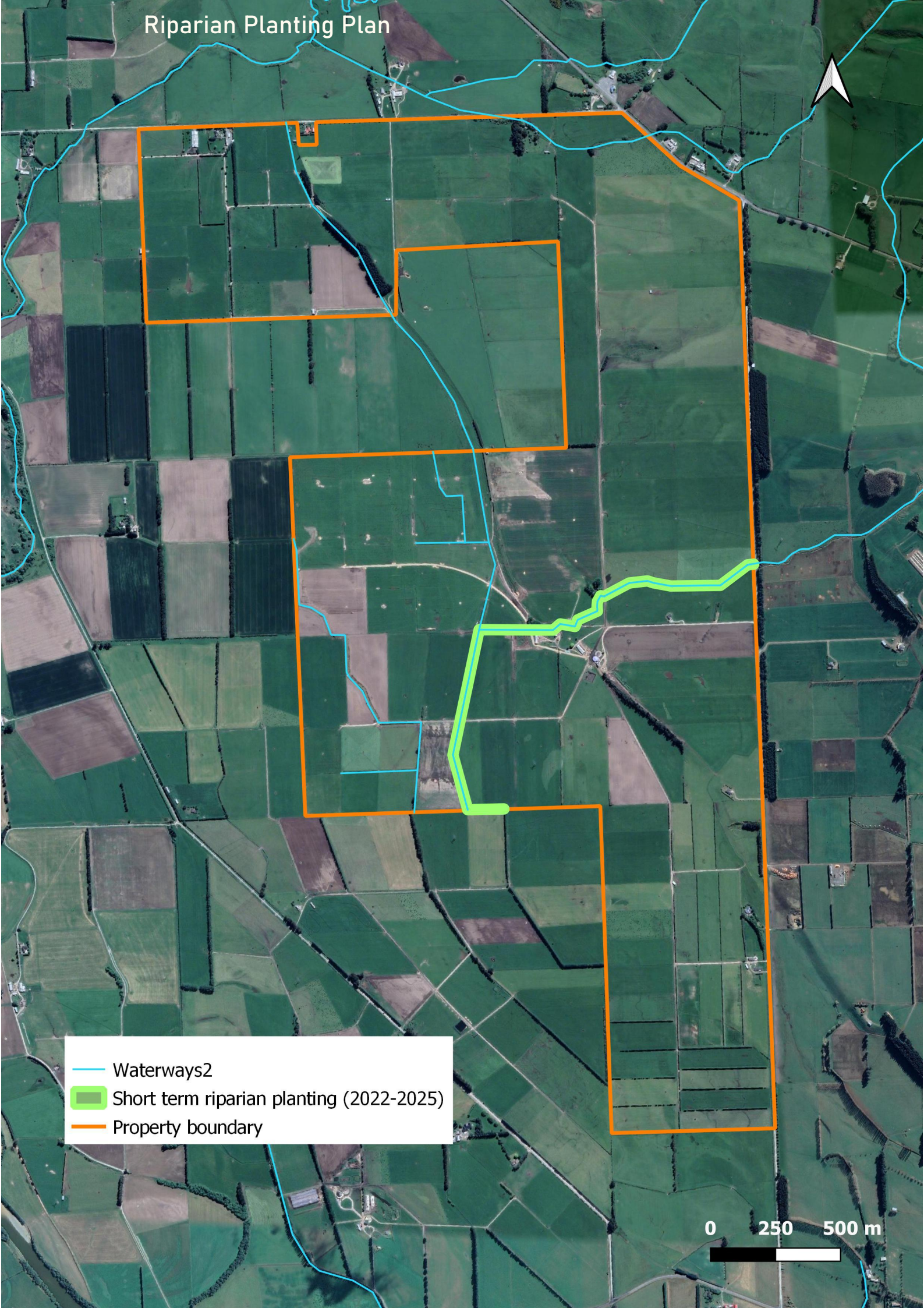
I trust the information provided here answers your questions. Please do not hesitate to contact me if you have any further questions.

Kind Regards,

Matilda Ballinger

Matilda Ballinger
Planner


Effluent Disposal Area
0
250
500 m


Riparian Planting Plan
Waterways2
Short term riparian planting (2022-2025)
Property boundary
0
250
500 m

Cashmere Bay Dairy Limited - Otama Farms 33254

145 Jaffray Road, Otamita 9777, New Zealand

OverseerFM

Year ending 2021

Analysis type	Year end
Is publication	No
Application version	4.1.2.4
Printed date	20 Dec 2021, 3:53PM
Model version	6.4.1

Farm details

N 43 kg/ha | 15,257 kg P 1 kg/ha | 354 kg GHG 14,544 kg/ha | 5,134 tonnes NCE: 27 v6.4.1

Total area	353 ha
Productive block area	344.40 ha
Nitrogen conversion efficiency (NCE)	27%
N Surplus	245 kg/ha
Region	Southland

Total liveweight brought (kg/ha grazed)	509	Milking herd size (peak cows/ha grazed)	2.9
Total liveweight reared (kg/ha grazed)	70	Percent male beef animals	100
Total liveweight sold (kg/ha grazed)	351	Beef / dairy grazing stock rate (RSU)	75
Milk production per cow (kg milk solids / cow)	465.3	Dairy stock rate (RSU)	10369
Milk solids (kg/ha grazed)	1351	Dairy replacements stock rate (RSU)	67

Blocks

NAME	TYPE	AREA (HA)	N LOSS	N LOSS/HA	N SURPLUS/HA	P LOSS	P LOSS/HA
MP Effluent Centre Pivot	Pasture	28.7	1,223	43.6	244	14	0.5
MP Effluent Large RR	Pasture	122	4,734	39.8	236	88	0.8
MP Effluent Small RR	Pasture	37	2,332	64.1	249	19	0.5
MP Non Effluent (lease) rolling	Pasture	36.7	1,479	41.2	204	17	0.5
MP Non effluent	Pasture	38.2	986	26.1	197	10	0.3
MP Non effluent (lease)	Pasture	81.8	3,497	43.7	205	17	0.2
MP fodderbeet	Fodder crop	6	684	114	230	2	0.4
Other sources	Other	-	322	-	-	186	-

Farm soils

S-MAP REF/NAME	GROUP/ORDER	DRAINAGE CLASS	MODIFIED	TOTAL AREA (HA)	% OF PROD. BLOCKS	BLOCKS
Balm_21a.1	Sedimentary/Brown	Well	No	23.1	6.7	2
Clar_33a.1	Recent/YGE/BGE/Pallic	Poor	No	27.7	8	3
Eure_20a.1	Sedimentary/Gley	Poor	No	4	1.2	1
Eure_23a.1	Sedimentary/Gley	Poor	No	45.6	13.3	3
Pyr2_2a.1	Recent/YGE/BGE/Pallic	Well	No	10.6	3.1	1
Selw_50a.1	Recent/YGE/BGE/Recent	Well	No	134.3	39	3
Stew_7a.1	Sedimentary/Brown	Well	No	99.1	28.8	3

Enterprises

STOCK NUMBERS

NAME	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Beef	-	-	-	-	-	-	-	-	-	-	-	133
Dairy	400	650	850	1020	1020	1020	1010	980	970	950	880	-
Dairy replacements	-	310	310	-	-	-	-	-	-	-	-	-

RSU

NAME	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Beef	0	0	0	0	0	0	0	0	0	0	0	74
Dairy	211	538	930	1219	1175	1284	1222	1023	1066	936	766	0
Dairy replacements	0	11	56	0	0	0	0	0	0	0	0	0

Irrigators

NAME	AREA COVERED	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
LINEAR AND CENTRE PIVOT Centre Pivot	28.2 ha												
TRAVELLING IRRIGATOR Large RR	119.9 ha												
TRAVELLING IRRIGATOR Small RR	36.4 ha												

Structures

NAME	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Milking Shed - Holding Pond | Solids: None | Pond: Spread On Blocks | Liquid: Spray Infrequently												
% of dairy animals	-	100	100	100	100	100	100	100	100	100	100	-
Uncovered Wintering Pad/Shelter - Use Farm System | Solids: Spread On Blocks | Pond: None | Liquid: None												
% of dairy animals	-	10	-	-	-	-	-	-	-	-	-	-
Hours on structure per day	-	undefined	-	-	-	-	-	-	-	-	-	-
Dairy Effluent System - Holding Pond | Solids: None | Pond: Spread On Blocks | Liquid: Spray Infrequently												

Supplements

CATEGORY	FEED	SOURCE	DRY WEIGHT?	AMOUNT	DESTINATION
Grains	Barley grain	Purchased (700)	No	700 tonnes	Dairy - Milking shed (700)
Baleage	-	MP Effluent Centre Pivot (5), MP Effluent Large RR (20), MP Effluent Small RR (5), MP Non Effluent (lease) rolling (8), MP Non effluent (8), MP Non effluent (lease) (10)	Yes	56 tonnes	Specified blocks (20), Dairy - Uncovered wintering pad/shelter (36)
Process byproducts	Palm kernel meal	Purchased (200)	No	200 tonnes	Dairy - Milking shed (200)
Silage	Baleage	Purchased (46)	Yes	46 tonnes	All pastoral blocks (46)

Crops

CROP/PASTURE	AREA (HA)	YIELD	GROWN (T/DM/YR)	INTAKE (T/DM/YR)	SUPPLEMENTS (T/DM/YR)
Ryegrass/white clover	338.4	-	5724	4808	56
Fodder beets	6.0	150 T dry matter	-	-	-

Fertiliser

MANUFACTURER/MATERIAL	NAME	TOTAL APPLIED (KG)	N	P	K	S	CA	MG	NA
Ballance	N-rich Urea	7,106	3,269	-	-	-	-	-	-
Ravensdown	Ammo 31	-	-	-	-	-	-	-	-
Ballance	Superten	6,091	-	548	-	640	1,340	-	-
Ravensdown	Potassium Chloride	24,468	-	-	12,234	-	-	-	294
Ravensdown	Sodium Chloride	-	-	-	-	-	-	-	-
Ravensdown	Esta Kieserite Granular	-	-	-	-	-	-	-	-
Ravensdown	Cropmaster DAP Boron Plus	-	-	-	-	-	-	-	-
Ravensdown	N-Protect	98,921	45,405	-	-	-	-	-	-
Ballance	PhaSed N QS	43,992	13,857	-	-	7,523	1,012	-	-
Ravensdown	DAP 13 S	-	-	-	-	-	-	-	-
Ballance	SustaiN	-	-	-	-	-	-	-	-
Ravensdown	Cropmaster DAP	37,651	6,627	7,530	-	377	-	-	-
Ravensdown	Granular Ammonium Sulphate	663	133	-	-	152	-	-	-
TOTAL		**218,893**	**69,290**	**8,078**	**12,234**	**8,691**	**2,352**	**-**	**294**

GHG - Total farm emissions

METHANE GHG EMISSIONS	N2O GHG EMISSIONS	CO2 GHG EMISSIONS	TOTAL GHG EMISSIONS
3364.8 eC02/tonnes/yr	1027.9 eC02/tonnes/yr	741.3 eC02/tonnes/yr	5134 eC02/tonnes/yr

Farm nutrient budget

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	15,257	43
Phosphorus	354	1

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	196	23	35	25	7	0	1
Irrigation	3	0	2	3	12	3	12
Supplements	49	10	17	6	2	4	2
Rain/clover fixation	89	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	43	1	13	36	55	3	11
As product	92	15	24	5	18	2	7
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	81	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	117	14	-2	-6	-5	-2	0
Standing plant material	-3	0	-3	0	0	0	0
Inorganic mineral	0	3	-21	0	-8	-12	-14
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	4	0	43	0	-38	17	15
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	3	0	1	1	0	0	0

Effluent report

The report shows rates and target areas for farm liquid effluent only, assuming it is all applied to pastoral blocks. It excludes any farm solid effluent or imported effluent that may be added to effluent blocks. If this occurs, then target areas may need to be increased.

CURRENT AREA RECEIVING LIQUID EFFLUENT	
Total area including crops	185 ha
Pastoral area receiving liquid	185 ha
% of farm pastoral area	55%
Average liquid effluent	43 kg N/ha/yr
Average fertiliser	201 kg N/ha/yr
Average other	19 kg N/ha/yr
AREA OF FARM TO APPLY ALL EFFLUENT TO ACHIEVE RATES OF	
150 kg N/ha/yr - Liquid	53 ha - based on the amount of effluent generated on the the farm and sprayed from sump.
150 kg N/ha/yr - Solid	30 ha
150 kg N/ha/yr - Total	83 ha
Maintenance K	1332 ha
100 kg K/ha/yr	119 ha
Maintenance K Warning	* Average K maintenance rates were less than 20 kg K/ha/yr - use with caution.
SOURCE OF N IN EFFLUENT BLOCK(S)	
Effluent from farm dairy	74%
Effluent from Feed pad	0%
Effluent from Standoff pad	0%
Effluent from wintering pad(s)	0%
Solids	26%
Exported	0%

Blocks

MP Effluent Centre Pivot

Pasture - Flat, 28.7 ha

N	43.6 kg/ha | 1,223 kg	P	0.5 kg/ha | 14 kg

BLOCK DETAILS

Area	28.7 ha	Average temp	10.1℃	Average rainfall	839 mm/yr	Annual PET	754 mm
Distance from coast	85 km						

SOILS

88%	EURE_23A.1	12%	STEW_7A.1
25.26 ha	Gley	3.44 ha	Brown

FODDER CROP ROTATIONS

MP fodderbeet

PASTURE

Pasture growth	16,915 kg DM/ha/yr	Dairy replacements	0.19 rsu/ha
Utilisation	85 %	Beef	0.16 rsu/ha
Intake	14,199 kg DM/ha/yr	Dairy	25.26 rsu/ha
Removed	178 kg DM/ha/yr		

ARTIFICIAL DRAINAGE

Percentage drained	60%
Drainage method	Mole/tile system

SUPPLEMENTS

Harvested (DM)	5 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Flat	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Dairy replacements	-	0.03	0.16	-	-	-	-	-	-	-	-	-
Beef	-	-	-	-	-	-	-	-	-	-	-	0.16
Dairy	0.44	0.83	2.32	3.03	2.93	3.2	3.04	2.55	2.65	2.35	1.92	-
FERTILISER APPLIED (KG/HA)												
N	-	41	8	39	15	15	13	29	42	-	-	-
P	-	-	9	13	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	-	1	-	-	-	-	2	-	-	-
IRRIGATION APPLIED (MM)												
Avg applied (mm)	-	-	-	-	62	63	69	53	-	-	-	-
CENTRE PIVOT (LINEAR AND CENTRE PIVOT): OVERSEER DEFAULT (FIXED) | N:2.5 P:0.1 K:1.6 S:2.5 CA:9.3 MG:2.2 NA:9.5												
Supplied (mm)	-	-	-	-	64	66	72	56	-	-	-	-
Applied (mm)	-	-	-	-	62	63	69	53	-	-	-	-
Depth (mm)	-	-	-	-	5	5	5	5	-	-	-	-
Return (days)	-	-	-	-	4	4	4	4	-	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Eure_23a.1	Centre Pivot	25.26 ha (88%)	971 kg	39 kg/ha	10.2 ppm	243 kg/ha	258 kg/ha	13 kg	0.5 kg/ha	Low	Low	Low
Stew_7a.1	Centre Pivot	3.44 ha (12%)	252 kg	77 kg/ha	18.7 ppm	250 kg/ha	258 kg/ha	1 kg	0.4 kg/ha	Low	Low	Low

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Eure_23a.1	Centre Pivot	25.26 ha (88%)	201 mm	0 mm	711 mm	231 mm	105 mm	291 mm	126 mm	-	-	-	-
Stew_7a.1	Centre Pivot	3.44 ha (12%)	220 mm	0 mm	711 mm	126 mm	57 mm	198 mm	69 mm	-	-	-	-

MODEL NOTES

Overview

Maintenance nutrient requirements for this block take account of nutrients added in effluent.

Total P inputs of fertiliser, imported effluent and on-farm effluent (33 kg P/ha/yr) should be lower than maintenance P (22 kg P/ha/yr) when Olsen P (39) is above that required for near maximum pasture production (30). Note that on high producing dairy farms, target Olsen P levels are higher.

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss and 1.5 kg P/ha/yr - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

Estimated change in soil test values for samples taken to 7.5cm:

- No change in Olsen P test
- Increase in QT K test of 1 units
- Increase in QT Mg test of 1 units

Stew_7a.1/Centre Pivot - 3.44 ha (12%)

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 250 kg/ha/yr pure lime. Review soil pH and lime requirement.

Eure_23a.1/Centre Pivot - 25.26 ha (88%)

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 120 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	1,223	43.6
Phosphorus	14	0.5

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	57	9	59	5	12	6	2
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	6.12	0	4.12	6.12	24.36	6	24.36
Supplements fed on blocks	2	0	2	0	1	0	0
Rain/clover fixation	91.72	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	43.56	0.49	12.88	40.12	55.6	4.12	16.24
As product	95	16	24	5	19	2	7
Transfer	15	-3	29	-2	6	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	83.12	0	0	0	0	0	0
As supplements and crop residues	3.12	1	4	0	1	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	117.16	14.88	0	-5	0	0	0
Inorganic mineral	0	4.12	-14	0	-4	-7	-8
Inorganic soil pool	0	0.12	46	0	-33.24	13	16.24

MP Effluent Large RR

Pasture - Flat, 122 ha

N	39.8 kg/ha | 4,734 kg	P	0.8 kg/ha | 88 kg

BLOCK DETAILS

Area	122 ha	Average temp	10.2℃	Average rainfall	847 mm/yr	Annual PET	756 mm
Distance from coast	85 km						

SOILS

76%	SELW_50A.1	14%	CLAR_33A.1	10%	EURE_23A.1
92.72 ha	Recent	17.08 ha	Pallic	12.2 ha	Gley

FODDER CROP ROTATIONS

MP fodderbeet

PASTURE

Pasture growth	16,915 kg DM/ha/yr	Dairy replacements	0.19 rsu/ha
Utilisation	85 %	Beef	0.16 rsu/ha
Intake	14,208 kg DM/ha/yr	Dairy	25.26 rsu/ha
Removed	167 kg DM/ha/yr		

ARTIFICIAL DRAINAGE

Percentage drained	60%
Drainage method	Mole/tile system

SUPPLEMENTS

Harvested (DM)	20 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Flat	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Dairy replacements	-	0.02	0.17	-	-	-	-	-	-	-	-	-
Beef	-	-	-	-	-	-	-	-	-	-	-	0.16
Dairy	0.43	0.83	2.31	3.04	2.93	3.2	3.04	2.55	2.65	2.36	1.92	-
FERTILISER APPLIED (KG/HA)												
N	-	41	8	39	15	15	13	29	42	-	-	-
P	-	-	9	13	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	-	1	-	-	-	-	2	-	-	-
IRRIGATION APPLIED (MM)												
Avg applied (mm)	-	-	-	-	48	60	39	64	-	-	-	-
LARGE RR (TRAVELLING IRRIGATOR): OVERSEER DEFAULT (FIXED) | N:2.5 P:0.1 K:1.6 S:2.5 CA:9.3 MG:2.2 NA:9.5												
Supplied (mm)	-	-	-	-	51	63	39	67	-	-	-	-
Applied (mm)	-	-	-	-	48	60	39	64	-	-	-	-
Depth (mm)	-	-	-	-	10	10	10	10	-	-	-	-
Return (days)	-	-	-	-	11	11	11	11	-	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Selw_50a.1	Large RR	92.72 ha (76%)	3,527 kg	39 kg/ha	10.8 ppm	235 kg/ha	258 kg/ha	70 kg	0.8 kg/ha	Low	Low	Low
Clar_33a.1	Large RR	17.08 ha (14%)	768 kg	46 kg/ha	12.8 ppm	240 kg/ha	258 kg/ha	12 kg	0.7 kg/ha	Low	Low	Low
Eure_23a.1	Large RR	12.2 ha (10%)	439 kg	37 kg/ha	10.2 ppm	240 kg/ha	258 kg/ha	6 kg	0.5 kg/ha	Low	Low	Low

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Selw_50a.1	Large RR	92.72 ha (76%)	189 mm	0 mm	710 mm	219 mm	81 mm	309 mm	138 mm	-	-	-	-
Clar_33a.1	Large RR	17.08 ha (14%)	189 mm	0 mm	710 mm	198 mm	102 mm	270 mm	96 mm	-	-	-	-
Eure_23a.1	Large RR	12.2 ha (10%)	191 mm	0 mm	710 mm	231 mm	105 mm	291 mm	126 mm	-	-	-	-

MODEL NOTES

Overview

Maintenance nutrient requirements for this block take account of nutrients added in effluent.

Total P inputs of fertiliser, imported effluent and on-farm effluent (33 kg P/ha/yr) should be lower than maintenance P (22 kg P/ha/yr) when Olsen P (39) is above that required for near maximum pasture production (30). Note that on high producing dairy farms, target Olsen P levels are higher.

Soil P loss status is high. Consider reducing Olsen P levels.

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

Eure_23a.1/Large RR - 12.2 ha (10%)

Fertiliser P loss is greater than 10% of total P loss and 1.5 kg P/ha/yr - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K

Estimated change in soil test values for samples taken to 7.5cm:

- No change in Olsen P test
- Increase in QT K test of 1 units
- Increase in QT Mg test of 1 units

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 120 kg/ha/yr pure lime. Review soil pH and lime requirement.

Clar_33a.1/Large RR - 17.08 ha (14%)

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K

Estimated change in soil test values for samples taken to 7.5cm:

- No change in Olsen P test
- Increase in QT K test of 1 units
- Increase in QT Mg test of 1 units

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 150 kg/ha/yr pure lime. Review soil pH and lime requirement.

Selw_50a.1/Large RR - 92.72 ha (76%)

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K, Na

Estimated change in soil test values for samples taken to 7.5cm:

- No change in Olsen P test
- Increase in QT K test of 1 units
- Increase in QT Mg test of 3 units

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 120 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	4,734	39.8
Phosphorus	88	0.8

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	57	9	59	5	12	6	2
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	5.24	0	4	5.24	20.1	5	21
Supplements fed on blocks	2	0	2	0	1	0	0
Rain/clover fixation	85.2	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	39.78	0.76	13	39.1	52.5	4	14
As product	95	16	24	5	19	2	7
Transfer	15	-3	29	-2	6	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	73.48	0	0	0	0	0	0
As supplements and crop residues	3	0	3	0	1	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	123.8	18.46	0	-5	0	0	0
Inorganic mineral	0	1.3	-15.8	0	-10.84	-17.64	-20.16
Inorganic soil pool	0	0	46.94	0	-26.8	22.88	27.16

MP Effluent Small RR

Pasture - Flat, 37 ha

N	64.1 kg/ha | 2,332 kg	P	0.5 kg/ha | 19 kg

BLOCK DETAILS

Area	37 ha	Average temp	10.2℃	Average rainfall	850 mm/yr	Annual PET	758 mm
Distance from coast	85 km						

SOILS

52%	BALM_21A.1	38%	SELW_50A.1	10%	CLAR_33A.1
19.24 ha	Brown	14.06 ha	Recent	3.7 ha	Pallic

FODDER CROP ROTATIONS

MP fodderbeet

PASTURE

Pasture growth	16,915 kg DM/ha/yr	Dairy replacements	0.2 rsu/ha
Utilisation	85 %	Beef	0.16 rsu/ha
Intake	14,232 kg DM/ha/yr	Dairy	25.29 rsu/ha
Removed	138 kg DM/ha/yr		

SUPPLEMENTS

Harvested (DM)	5 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Flat	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Dairy replacements	-	0.03	0.17	-	-	-	-	-	-	-	-	-
Beef	-	-	-	-	-	-	-	-	-	-	-	0.16
Dairy	0.44	0.83	2.32	3.04	2.92	3.2	3.06	2.56	2.66	2.34	1.92	-
FERTILISER APPLIED (KG/HA)												
N	-	41	8	39	15	15	13	29	42	-	-	-
P	-	-	9	13	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	-	1	-	-	-	-	2	-	-	-
IRRIGATION APPLIED (MM)												
Avg applied (mm)	-	-	-	-	87	75	74	69	-	-	-	-
SMALL RR (TRAVELLING IRRIGATOR): OVERSEER DEFAULT (FIXED) | N:2.5 P:0.1 K:1.6 S:2.5 CA:9.3 MG:2.2 NA:9.5												
Supplied (mm)	-	-	-	-	91	79	78	72	-	-	-	-
Applied (mm)	-	-	-	-	87	75	74	69	-	-	-	-
Depth (mm)	-	-	-	-	10	10	10	10	-	-	-	-
Return (days)	-	-	-	-	5	5	5	5	-	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Balm_21a.1	Small RR	19.24 ha (52%)	1,519 kg	80 kg/ha	16.7 ppm	255 kg/ha	258 kg/ha	5 kg	0.2 kg/ha	Low	Low	Low
Selw_50a.1	Small RR	14.06 ha (38%)	620 kg	45 kg/ha	10.9 ppm	240 kg/ha	258 kg/ha	10 kg	0.7 kg/ha	Low	Medium	Low
Clar_33a.1	Small RR	3.7 ha (10%)	193 kg	54 kg/ha	12.5 ppm	248 kg/ha	258 kg/ha	4 kg	1.2 kg/ha	Medium	Medium	Low

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Balm_21a.1	Small RR	19.24 ha (52%)	491 mm	0 mm	714 mm	129 mm	57 mm	198 mm	72 mm	-	-	-	-
Selw_50a.1	Small RR	14.06 ha (38%)	414 mm	0 mm	713 mm	219 mm	81 mm	309 mm	138 mm	-	-	-	-
Clar_33a.1	Small RR	3.7 ha (10%)	435 mm	0 mm	713 mm	198 mm	102 mm	270 mm	96 mm	-	-	-	-

MODEL NOTES

Overview

Maintenance nutrient requirements for this block take account of nutrients added in effluent.

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

Clar_33a.1/Small RR - 3.7 ha (10%)

Olsen P (39) is above that required for near maximum pasture production (30). See a consultant about reducing fertiliser P inputs. Note that on high producing dairy farms, target Olsen P levels are higher.

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K

Estimated change in soil test values for samples taken to 7.5cm:

- No change in Olsen P test
- Increase in QT K test of 1 units
- Increase in QT Mg test of 1 units

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 180 kg/ha/yr pure lime. Review soil pH and lime requirement.

Selw_50a.1/Small RR - 14.06 ha (38%)

Total P inputs of fertiliser, imported effluent and on-farm effluent (33 kg P/ha/yr) should be lower than maintenance P (22 kg P/ha/yr) when Olsen P (39) is above that required for near maximum pasture production (30). Note that on high producing dairy farms, target Olsen P levels are higher.

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K, Na

Estimated change in soil test values for samples taken to 7.5cm:

- No change in Olsen P test
- Increase in QT K test of 1 units
- Increase in QT Mg test of 3 units

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 140 kg/ha/yr pure lime. Review soil pH and lime requirement.

Balm_21a.1/Small RR - 19.24 ha (52%)

Total P inputs of fertiliser, imported effluent and on-farm effluent (33 kg P/ha/yr) should be lower than maintenance P (22 kg P/ha/yr) when Olsen P (39) is above that required for near maximum pasture production (30). Note that on high producing dairy farms, target Olsen P levels are higher.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K

Estimated change in soil test values for samples taken to 7.5cm:

- No change in Olsen P test
- Increase in QT K test of 1 units
- Increase in QT Mg test of 1 units

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 270 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	2,332	64.1
Phosphorus	19	0.5

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	57	9	59	5	12	6	2
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	8.04	0	5.14	8.04	29.84	7.14	30.36
Supplements fed on blocks	2	0	2	0	1	0	0
Rain/clover fixation	94.46	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	64.1	0.55	12	42.04	72.78	6.04	20.18
As product	96	16	24	5	19	2	7
Transfer	15	-3	29	-2	6	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	71.06	0	0	0	0	0	0
As supplements and crop residues	3	0	3	0	1	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	113.54	16.82	0	-5	0	0	0
Inorganic mineral	0	2.56	-14.44	0	-7.42	-12.32	-14.08
Inorganic soil pool	0	0.52	48.58	0	-41	18.32	24.74

MP Non effluent

Pasture - Flat, 38.2 ha

N	26.1 kg/ha | 986 kg	P	0.3 kg/ha | 10 kg

BLOCK DETAILS

Area	38.2 ha	Average temp	10.2℃	Average rainfall	859 mm/yr	Annual PET	759 mm
Distance from coast	85 km						

SOILS

72%	SELW_50A.1	18%	CLAR_33A.1	10%	BALM_21A.1
27.5 ha	Recent	6.88 ha	Pallic	3.82 ha	Brown

FODDER CROP ROTATIONS

MP fodderbeet

PASTURE

Pasture growth	16,915 kg DM/ha/yr	Dairy replacements	0.2 rsu/ha
Utilisation	85 %	Beef	0.17 rsu/ha
Intake	14,168 kg DM/ha/yr	Dairy	25.2 rsu/ha
Removed	213 kg DM/ha/yr		

SUPPLEMENTS

Harvested (DM)	8 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Flat	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Dairy replacements	-	0.03	0.17	-	-	-	-	-	-	-	-	-
Beef	-	-	-	-	-	-	-	-	-	-	-	0.17
Dairy	0.44	0.83	2.31	3.03	2.92	3.19	3.03	2.54	2.66	2.33	1.92	-
FERTILISER APPLIED (KG/HA)												
N	-	41	8	39	15	15	13	29	42	-	-	-
P	-	-	9	13	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	-	1	-	-	-	-	2	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Selw_50a.1	-	27.5 ha (72%)	605 kg	22 kg/ha	11.2 ppm	195 kg/ha	215 kg/ha	7 kg	0.3 kg/ha	Low	Low	Low
Clar_33a.1	-	6.88 ha (18%)	222 kg	33 kg/ha	14.3 ppm	201 kg/ha	215 kg/ha	3 kg	0.4 kg/ha	Low	Low	Low
Balm_21a.1	-	3.82 ha (10%)	159 kg	43 kg/ha	17.5 ppm	205 kg/ha	215 kg/ha	0 kg	0.1 kg/ha	Low	Low	N/A

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Selw_50a.1	-	27.5 ha (72%)	201 mm	0 mm	659 mm	219 mm	81 mm	309 mm	138 mm	-	-	-	-
Clar_33a.1	-	6.88 ha (18%)	228 mm	0 mm	631 mm	198 mm	102 mm	270 mm	96 mm	-	-	-	-
Balm_21a.1	-	3.82 ha (10%)	247 mm	0 mm	612 mm	129 mm	57 mm	198 mm	72 mm	-	-	-	-

MODEL NOTES

Overview

Maintenance nutrient requirements for this block take account of nutrients added in effluent.

Olsen P (39) is above that required for near maximum pasture production (30). See a consultant about reducing fertiliser P inputs. Note that on high producing dairy farms, target Olsen P levels are higher.

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

Balm_21a.1/No irrigation - 3.82 ha (10%)

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 1 units
- No change in QT K test
- Increase in QT Mg test of 1 units

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 170 kg/ha/yr pure lime. Review soil pH and lime requirement.

Clar_33a.1/No irrigation - 6.88 ha (18%)

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 1 units
- No change in QT K test
- Increase in QT Mg test of 1 units

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 130 kg/ha/yr pure lime. Review soil pH and lime requirement.

Selw_50a.1/No irrigation - 27.5 ha (72%)

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 1 units
- No change in QT K test
- Increase in QT Mg test of 3 units

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 100 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	986	26.1
Phosphorus	10	0.3

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	13	7	6	3	11	5	1
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	0	0	0	0	0	0	0
Supplements fed on blocks	2	0	2	0	1	0	0
Rain/clover fixation	94.26	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	26.08	0.3	12	32	42.04	1.1	4.66
As product	95	16	24	5	19	2	7
Transfer	15	-3	29	-2	6	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	63.98	0	0	0	0	0	0
As supplements and crop residues	4	1	4	0	1	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	107.02	18.42	0	-5	0	0	0
Inorganic mineral	0	1.3	-29.9	0	-10.48	-17.08	-19.52
Inorganic soil pool	0	-2	5.9	0	-37.66	19.98	13.86

MP Non effluent (lease)

Pasture - Flat, 81.8 ha

N	43.7 kg/ha | 3,497 kg	P	0.2 kg/ha | 17 kg

BLOCK DETAILS

Area	81.8 ha	Average temp	10.1℃	Average rainfall	834 mm/yr	Annual PET	753 mm
Distance from coast	85 km						

SOILS

90%	STEW_7A.1	10%	EURE_23A.1
73.62 ha	Brown	8.18 ha	Gley

FODDER CROP ROTATIONS

MP fodderbeet

PASTURE

Pasture growth	16,915 kg DM/ha/yr	Dairy replacements	0.2 rsu/ha
Utilisation	85 %	Beef	0.16 rsu/ha
Intake	14,244 kg DM/ha/yr	Dairy	25.35 rsu/ha
Removed	124 kg DM/ha/yr		

ARTIFICIAL DRAINAGE

Percentage drained	60%
Drainage method	Mole/tile system

SUPPLEMENTS

Harvested (DM)	10 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Flat	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Dairy replacements	-	0.03	0.17	-	-	-	-	-	-	-	-	-
Beef	-	-	-	-	-	-	-	-	-	-	-	0.16
Dairy	0.44	0.83	2.32	3.04	2.94	3.21	3.06	2.56	2.66	2.36	1.93	-
FERTILISER APPLIED (KG/HA)												
N	-	41	8	39	15	15	13	29	42	-	-	-
P	-	-	9	13	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	-	1	-	-	-	-	2	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Stew_7a.1	-	**73.62 ha (90%)**	3,309 kg	46 kg/ha	19.5 ppm	206 kg/ha	215 kg/ha	15 kg	0.2 kg/ha	Low	Low	Low
Eure_23a.1	-	**8.18 ha (10%)**	188 kg	23 kg/ha	12.1 ppm	198 kg/ha	215 kg/ha	2 kg	0.3 kg/ha	Low	Low	Low

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Stew_7a.1	-	**73.62 ha (90%)**	122 mm	0 mm	599 mm	126 mm	57 mm	198 mm	69 mm	-	-	-	-
Eure_23a.1	-	**8.18 ha (10%)**	100 mm	0 mm	643 mm	231 mm	105 mm	291 mm	126 mm	-	-	-	-

MODEL NOTES

Overview

Maintenance nutrient requirements for this block take account of nutrients added in effluent.

Olsen P (39) is above that required for near maximum pasture production (30). See a consultant about reducing fertiliser P inputs. Note that on high producing dairy farms, target Olsen P levels are higher.

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 1 units
- No change in QT K test
- Increase in QT Mg test of 1 units

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Eure_23a.1/No irrigation - 8.18 ha (10%)

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss and 1.5 kg P/ha/yr - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 100 kg/ha/yr pure lime. Review soil pH and lime requirement.

Stew_7a.1/No irrigation - 73.62 ha (90%)

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 180 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	3,497	43.7
Phosphorus	17	0.2

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	13	7	6	3	11	5	1
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	0	0	0	0	0	0	0
Supplements fed on blocks	2	0	2	0	1	0	0
Rain/clover fixation	101.2	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	43.7	0.21	12	32	56.2	1	6.7
As product	96	16	24	5	19	2	7
Transfer	15	-3	29	-2	6	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	61.6	0	0	0	0	0	0
As supplements and crop residues	2	0	2	0	1	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	99.8	14.1	0	-5	0	0	0
Inorganic mineral	0	4.9	-28	0	-4	-7	-8
Inorganic soil pool	0	-2	5	0	-58.2	9.1	0.3

MP Non Effluent (lease) rolling

Pasture - Rolling, 36.7 ha

N	41.2 kg/ha | 1,479 kg	P	0.5 kg/ha | 17 kg

BLOCK DETAILS

Area	36.7 ha	Average temp	10℃	Average rainfall	836 mm/yr	Annual PET	750 mm
Distance from coast	85 km						

SOILS

60%	STEW_7A.1	29%	PYR2_2A.1	11%	EURE_20A.1
22.02 ha	Brown	10.64 ha	Pallic	4.04 ha	Gley

FODDER CROP ROTATIONS

MP fodderbeet

PASTURE

Pasture growth	16,915 kg DM/ha/yr	Dairy replacements	0.2 rsu/ha
Utilisation	85 %	Beef	0.17 rsu/ha
Intake	14,160 kg DM/ha/yr	Dairy	25.19 rsu/ha
Removed	223 kg DM/ha/yr		

SUPPLEMENTS

Harvested (DM)	8 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Rolling	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Dairy replacements	-	0.03	0.17	-	-	-	-	-	-	-	-	-
Beef	-	-	-	-	-	-	-	-	-	-	-	0.17
Dairy	0.44	0.83	2.31	3.03	2.92	3.19	3.03	2.54	2.65	2.34	1.91	-
FERTILISER APPLIED (KG/HA)												
N	-	41	8	39	15	15	13	29	42	-	-	-
P	-	-	9	13	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	-	1	-	-	-	-	2	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Stew_7a.1	-	22.02 ha (60%)	994 kg	46 kg/ha	19.4 ppm	205 kg/ha	215 kg/ha	5 kg	0.2 kg/ha	Low	Low	Low
Pyr2_2a.1	-	10.64 ha (29%)	394 kg	38 kg/ha	16.6 ppm	205 kg/ha	215 kg/ha	9 kg	0.9 kg/ha	Medium	Medium	Low
Eure_20a.1	-	4.04 ha (11%)	91 kg	23 kg/ha	12.1 ppm	198 kg/ha	215 kg/ha	3 kg	0.7 kg/ha	Low	Medium	Low

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Stew_7a.1	-	22.02 ha (60%)	237 mm	0 mm	599 mm	126 mm	57 mm	198 mm	69 mm	-	-	-	-
Pyr2_2a.1	-	10.64 ha (29%)	228 mm	0 mm	609 mm	210 mm	132 mm	270 mm	78 mm	-	-	-	-
Eure_20a.1	-	4.04 ha (11%)	194 mm	0 mm	643 mm	243 mm	117 mm	297 mm	126 mm	-	-	-	-

MODEL NOTES

Overview

Maintenance nutrient requirements for this block take account of nutrients added in effluent.

Olsen P (39) is above that required for near maximum pasture production (30). See a consultant about reducing fertiliser P inputs. Note that on high producing dairy farms, target Olsen P levels are higher.

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 1 units
- No change in QT K test
- Increase in QT Mg test of 1 units

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Eure_20a.1/No irrigation - 4.04 ha (11%)

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 100 kg/ha/yr pure lime. Review soil pH and lime requirement.

Pyr2_2a.1/No irrigation - 10.64 ha (29%)

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 150 kg/ha/yr pure lime. Review soil pH and lime requirement.

Stew_7a.1/No irrigation - 22.02 ha (60%)

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 180 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	1,479	41.2
Phosphorus	17	0.5

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	13	7	6	3	11	5	1
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	0	0	0	0	0	0	0
Supplements fed on blocks	2	0	2	0	1	0	0
Rain/clover fixation	101.94	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	41.15	0.46	12	32	53.99	1	6.38
As product	95	16	24	5	19	2	7
Transfer	15	-3	29	-2	6	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	63.02	0	0	0	0	0	0
As supplements and crop residues	4	1	4	0	1	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	99.77	15.56	0	-5	0	0	0
Inorganic mineral	0	3.73	-29.29	0	-4	-7	-8
Inorganic soil pool	0	-2.4	5.29	0	-56.28	9.11	0.33

MP fodderbeet

Fodder crop - 6 ha (rotation)

N	114 kg/ha | 684 kg	P	0.4 kg/ha | 2 kg

BLOCK DETAILS

Area	6 ha

ROTATES THROUGH

MP Effluent Centre Pivot, MP Effluent Large RR, MP Effluent Small RR, MP Non Effluent (lease) rolling, MP Non effluent, MP Non effluent (lease)

ARTIFICIAL DRAINAGE

Drainage method	**None**

CROP MANAGEMENT

Block type	**Fodder crop**	Low N mineralisation capacity	**No**
Rotation name	**MP fodderbeet**	Month resown in pasture	**October**
Area	**6ha**	Months since fertiliser applied to pasture	**0**

CROPS

Fodder beets

Category	Fodder
Crop type	Fodder beets
Sown	November - Reporting year
Yield	150T
Cultivation practice at sowing	Conventional

Pasture

Category	Permanent pasture
Crop type	Pasture
Sown	October - Reporting year
Cultivation practice at sowing	Conventional
Defoliation management	Grazing only

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
	Fodder beets											Pasture
FERTILISER APPLIED (KG/HA)												
N	54	69	-	-	69	-	-	-	-	-	-	-
P	37	-	-	-	-	-	-	-	-	-	-	-
K	37	-	-	-	-	-	-	-	-	-	-	-
S	27	-	-	-	-	-	-	-	-	-	-	-

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	684	114
Phosphorus	2	0.4

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	0	0	0	0	0	0	0
Fertiliser, lime and other	192	37	37	27	0	0	1
Irrigation	0	0	0	0	0	0	0
Supplements	57	8	59	5	15	4	3
Rain/clover fixation	2	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	114	0.5	6	47	112	4	11
As product	23	-3	21	-4	-20	1	5
Transfer	-1	-2	13	-1	6	0	2
Effluent exported	0	0	0	0	0	0	0
To atmosphere	71	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	-168	-24	0	-39	0	0	0
Standing plant material	-169	-20	-161	-11	-17	-12	-8
Inorganic mineral	0	1	-13	0	-13	-20	-24
Inorganic plant available	215	68	181	0	-79	27	0
Root and stover residuals	167	25	49	42	27	5	21

Cashmere Bay Dairy Limited - Otama Farms 33254

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OverseerFM

YR END 21 SUPPORT 1

Analysis type	Predictive
Is publication	No
Application version	4.1.2.4
Printed date	20 Dec 2021, 3:54PM
Model version	6.4.1

Farm details

N 24 kg/ha | 2,131 kg P 0.4 kg/ha | 37 kg GHG 8,658 kg/ha | 779.2 tonnes NCE: 17 v6.4.1

Total area	89.6 ha
Productive block area	89.60 ha
Nitrogen conversion efficiency (NCE)	17%
N Surplus	189 kg/ha
Region	Southland

Total liveweight brought (kg/ha grazed)	612
Total liveweight reared (kg/ha grazed)	1007
Total liveweight sold (kg/ha grazed)	1547

Percent male beef animals	100
Dairy grazing stock rate (RSU)	1467

Blocks

NAME	TYPE	AREA (HA)	N LOSS	N LOSS/HA	N SURPLUS/HA	P LOSS	P LOSS/HA
Pasture	Pasture	89.6	1,542	18.3	178	25	0.3
Support 1 fodderbeet	Fodder crop	6	576	96	293	3	0.5
Other sources	Other	-	14	-	-	9	-

Farm soils

S-MAP REF/NAME	GROUP/ORDER	DRAINAGE CLASS	MODIFIED	TOTAL AREA (HA)	% OF PROD. BLOCKS	BLOCKS
Clar_33a.1	Recent/YGE/BGE/Pallic	Poor	No	43.9	49	1
Selw_50a.1	Recent/YGE/BGE/Recent	Well	No	20.6	23	1
Stew_7a.1	Sedimentary/Brown	Well	No	25.1	28	1

Enterprises

STOCK NUMBERS

NAME	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Beef	-	-	-	6	126	126	126	120	120	-	-	-
Dairy grazing	210	210	210	520	420	420	420	420	420	411	411	210

RSU

NAME	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Beef	0	0	0	1	14	39	43	41	41	0	0	0
Dairy grazing	46	65	73	168	171	160	155	137	147	144	152	47

Irrigators

There is no irrigation on this farm.

Structures

No structures exist.

Supplements

CATEGORY	FEED	SOURCE	DRY WEIGHT?	AMOUNT	DESTINATION
Baleage	-	Pasture (58)	Yes	58 tonnes	Specified blocks (58)
Baleage	-	Pasture (46)	Yes	46 tonnes	Off farm (46)

Crops

CROP/PASTURE	AREA (HA)	YIELD	GROWN (T/DM/YR)	INTAKE (T/DM/YR)	SUPPLEMENTS (T/DM/YR)
Ryegrass/white clover	83.6	-	1191	761	104
Fodder beets	6.0	150 T dry matter	-	-	-

Fertiliser

MANUFACTURER/MATERIAL	NAME	TOTAL APPLIED (KG)	N	P	K	S	CA	MG	NA
Ravensdown	Potassium Chloride	14,378	-	-	7,189	-	-	-	173
Ravensdown	Superphosphate	1,505	-	135	-	166	301	-	-
Ravensdown	Sodium Chloride	-	-	-	-	-	-	-	-
Ravensdown	Esta Kieserite Granular	-	-	-	-	-	-	-	-
Ravensdown	N-Protect	25,793	11,839	-	-	-	-	-	-
Ravensdown	Cropmaster DAP Boron Plus	-	-	-	-	-	-	-	-
Ballance	PhaSed N QS	10,868	3,423	-	-	1,858	250	-	-
Ravensdown	Ammo 31	-	-	-	-	-	-	-	-
Ravensdown	DAP 13 S	-	-	-	-	-	-	-	-
Ballance	SustaiN	-	-	-	-	-	-	-	-
Ravensdown	Flexi-N	-	-	-	-	-	-	-	-
Ravensdown	Granular Ammonium Sulphate	663	133	-	-	152	-	-	-
Ravensdown	Cropmaster DAP	10,133	1,783	2,027	-	101	-	-	-
Ravensdown	Urea	1,756	808	-	-	-	-	-	-
TOTAL		**65,095**	**17,986**	**2,162**	**7,189**	**2,278**	**551**	**-**	**173**

GHG - Total farm emissions

METHANE GHG EMISSIONS	N20 GHG EMISSIONS	C02 GHG EMISSIONS	TOTAL GHG EMISSIONS
492.7 eC02/tonnes/yr	190.3 eC02/tonnes/yr	96.3 eC02/tonnes/yr	779.2 eC02/tonnes/yr

Farm nutrient budget

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	2,131	24
Phosphorus	37	0.4

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	199	24	79	25	6	0	2
Irrigation	0	0	0	0	0	0	0
Supplements	0	0	0	0	0	0	0
Rain/clover fixation	29	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	24	0.4	12	27	40	1	5
As product	30	7	2	4	15	0	1
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	46	0	0	0	0	0	0
As supplements and crop residues	9	2	10	1	2	1	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	111	17	1	-6	0	0	0
Standing plant material	-11	-1	-13	-1	-1	0	-1
Inorganic mineral	0	3	-19	0	-6	-9	-11
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	11	-6	86	0	-45	9	10
Change in supplement storage	0	0	0	0	0	0	0
Root and stover residuals	9	1	2	2	1	0	1

Blocks

Pasture

Pasture - Flat, 89.6 ha

N	18.3 kg/ha | 1,542 kg

P	0.3 kg/ha | 25 kg

BLOCK DETAILS

Area	89.6 ha	Average temp	10.2℃	Average rainfall	829 mm/yr	Annual PET	754 mm
Distance from coast	85 km						

SOILS

49%	CLAR_33A.1	23%	SELW_50A.1	28%	STEW_7A.1
43.9 ha	Pallic	20.61 ha	Recent	25.09 ha	Brown

FODDER CROP ROTATIONS

Support 1 fodderbeet

PASTURE

Pasture growth	14,244 kg DM/ha/yr	Removed	1244 kg DM/ha/yr
Utilisation	70 %	Beef	2.13 rsu/ha
Intake	9,100 kg DM/ha/yr	Dairy grazing	14.2 rsu/ha

SUPPLEMENTS

Harvested (DM)	104 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Flat	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Beef	-	-	-	-	0.17	0.47	0.51	0.49	0.49	-	-	-
Dairy grazing	0.06	0.08	0.87	2.02	2.04	1.92	1.86	1.64	1.75	1.72	0.18	0.06
FERTILISER APPLIED (KG/HA)												
N	-	41	8	39	15	15	13	29	32	10	-	-
P	-	-	9	13	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	-	1	-	-	-	-	2	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Clar_33a.1	-	43.9 ha (49%)	739 kg	18 kg/ha	8.6 ppm	178 kg/ha	201 kg/ha	18 kg	0.4 kg/ha	Low	Low	N/A
Selw_50a.1	-	20.61 ha (23%)	233 kg	12 kg/ha	6.7 ppm	178 kg/ha	201 kg/ha	5 kg	0.3 kg/ha	Low	Low	N/A
Stew_7a.1	-	25.09 ha (28%)	570 kg	24 kg/ha	10.5 ppm	178 kg/ha	201 kg/ha	2 kg	0.1 kg/ha	Low	Low	N/A

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Clar_33a.1	-	43.9 ha (49%)	209 mm	0 mm	621 mm	198 mm	102 mm	270 mm	96 mm	-	-	-	-
Selw_50a.1	-	20.61 ha (23%)	181 mm	0 mm	648 mm	219 mm	81 mm	309 mm	138 mm	-	-	-	-
Stew_7a.1	-	25.09 ha (28%)	231 mm	0 mm	598 mm	126 mm	57 mm	198 mm	69 mm	-	-	-	-

MODEL NOTES

Overview

Olsen P (51) is above that required for near maximum pasture production (30). See a consultant about reducing fertiliser P inputs. Note that on high producing dairy farms, target Olsen P levels are higher.

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

K input as supplements is contributing to increased soil K. Consider reducing other K inputs (see maintenance fertiliser requirements).

Stew_7a.1/No irrigation - 25.09 ha (28%)

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 2 units
- No change in QT K test
- No change in QT Mg test

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 120 kg/ha/yr pure lime. Review soil pH and lime requirement.

Selw_50a.1/No irrigation - 20.61 ha (23%)

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K, Na

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 3 units
- No change in QT K test
- Increase in QT Mg test of 2 units

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 80 kg/ha/yr pure lime. Review soil pH and lime requirement.

Clar_33a.1/No irrigation - 43.9 ha (49%)

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for K

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 3 units
- No change in QT K test
- No change in QT Mg test

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 100 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	1,542	18.3
Phosphorus	25	0.3

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	0	0	0	0	0	0	0
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	0	0	0	0	0	0	0
Supplements fed on blocks	0	0	0	0	0	0	0
Rain/clover fixation	31.77	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	18.3	0.3	9	26	36.25	1	4.82
As product	29	7	2	3	15	0	1
Transfer	3	0	3	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	46.21	0	0	0	0	0	0
As supplements and crop residues	22.77	4	23	2	6	2	1

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	113.98	19.83	0	-4	0	0	0
Inorganic mineral	0	3.17	-20.93	0	-6.07	-9.99	-11.45
Inorganic soil pool	0	-11	20.44	0	-43.41	7.99	8.63

Support 1 fodderbeet

Fodder crop - 6 ha (rotation)

N	96 kg/ha | 576 kg

P	0.5 kg/ha | 3 kg

BLOCK DETAILS

Area	6 ha

ROTATES THROUGH

Pasture

ARTIFICIAL DRAINAGE

Drainage method	None

CROP MANAGEMENT

Block type	Fodder crop	Low N mineralisation capacity	No
Rotation name	Support 1 fodderbeet	Month resown in pasture	October
Area	6ha	Months since fertiliser applied to pasture	0

CROPS

Fodder beets

Category	Fodder
Crop type	Fodder beets
Sown	November - Reporting year
Yield	150T
Cultivation practice at sowing	Conventional

Pasture

Category	Permanent pasture
Crop type	Pasture
Sown	October - Reporting year
Cultivation practice at sowing	Conventional
Defoliation management	Grazing only

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
	Fodder beets											Pasture
FERTILISER APPLIED (KG/HA)												
N	54	69	-	-	69	-	-	-	-	-	-	-
P	37	-	-	-	-	-	-	-	-	-	-	-
K	704	-	-	-	-	-	-	-	-	-	-	-
S	27	-	-	-	-	-	-	-	-	-	-	-

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OverseerFM

YR END 21 SUPPORT 2

Analysis type	Predictive
Is publication	No
Application version	4.1.2.4
Printed date	20 Dec 2021, 3:55PM
Model version	6.4.1

Farm details

N 70 kg/ha | 5,651 kg P 0.5 kg/ha | 40 kg GHG 9,552 kg/ha | 764.2 tonnes NCE: 7 v6.4.1

Total area	80.3 ha
Productive block area	76.50 ha
Nitrogen conversion efficiency (NCE)	7%
N Surplus	176 kg/ha
Region	Southland

Total liveweight brought (kg/ha grazed)	24382
Total liveweight reared (kg/ha grazed)	1161
Total liveweight sold (kg/ha grazed)	25246

Percent male beef animals	100
Dairy grazing stock rate (RSU)	853

Blocks

NAME	TYPE	AREA (HA)	N LOSS	N LOSS/HA	N SURPLUS/HA	P LOSS	P LOSS/HA
Pasture	Pasture	10.4	287	27.4	176	3	0.2
Pasture	Pasture	29.1	703	24.1	180	10	0.3
Kale Winter 21 (ex swedes)	Crop	17	2,141	125.2	264	9	0.5
Kale Winter 21 (ex swedes)	Crop	13	1,857	142.2	265	3	0.2
Swedes Winter 20 (into grass)	Crop	7	646	90.7	18	2	0.3
Other sources	Other	-	17	-	-	14	-

Farm soils

S-MAP REF/NAME	GROUP/ORDER	DRAINAGE CLASS	MODIFIED	TOTAL AREA (HA)	% OF PROD. BLOCKS	BLOCKS
Clar_33a.1	Recent/YGE/BGE/Pallic	Poor	No	29.2	38.2	3
Eure_23a.1	Sedimentary/Gley	Poor	No	7.3	9.5	2
Selw_50a.1	Recent/YGE/BGE/Recent	Well	No	9	11.8	3
Stew_7a.1	Sedimentary/Brown	Well	No	31	40.5	5

Enterprises

STOCK NUMBERS

NAME	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Beef	210	210	108	108	108	108	108	108	108	228	253	120
Dairy grazing	600	350	150	-	-	-	-	-	-	-	-	1000

RSU

NAME	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Beef	129	127	86	58	60	64	61	57	59	100	110	48
Dairy grazing	244	154	76	0	0	0	0	0	0	0	0	383

Irrigators

There is no irrigation on this farm.

Structures

No structures exist.

Supplements

CATEGORY	FEED	SOURCE	DRY WEIGHT?	AMOUNT	DESTINATION
Baleage	-	From storage (90)	No	90 tonnes	Specified blocks (90)
Baleage	-	Pasture (24), Pasture (59)	Yes	83 tonnes	Specified blocks (83)

Crops

CROP/PASTURE	AREA (HA)	YIELD	GROWN (T/DM/YR)	INTAKE (T/DM/YR)	SUPPLEMENTS (T/DM/YR)
Ryegrass/white clover	39.5	-	638	419	83
Kale	30.0	390 T dry matter	-	-	-
Pasture	7.0	-	-	-	-

Fertiliser

MANUFACTURER/MATERIAL	NAME	TOTAL APPLIED (KG)	N	P	K	S	CA	MG	NA
Ballance	N-rich Urea	830	382	-	-	-	-	-	-
Ballance	Superten	711	-	64	-	75	156	-	-
Ravensdown	Potassium Chloride	2,805	-	-	1,402	-	-	-	34
Ravensdown	N-Protect	20,336	9,334	-	-	-	-	-	-
Lime	Lime (good quality)	-	-	-	-	-	-	-	-
Ravensdown	Cropmaster DAP	13,266	2,335	2,653	-	133	-	-	-
Ballance	PhaSed N QS	5,135	1,618	-	-	878	118	-	-
Ravensdown	Ammo 31	-	-	-	-	-	-	-	-
Ravensdown	DAP 13 S	-	-	-	-	-	-	-	-
Ballance	SustaiN	-	-	-	-	-	-	-	-
TOTAL		43,083	13,668	2,717	1,402	1,085	275	-	34

GHG - Total farm emissions

METHANE GHG EMISSIONS	N20 GHG EMISSIONS	C02 GHG EMISSIONS	TOTAL GHG EMISSIONS
514.6 eC02/tonnes/yr	167.2 eC02/tonnes/yr	82.3 eC02/tonnes/yr	764.2 eC02/tonnes/yr

Farm nutrient budget

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	5,651	70
Phosphorus	40	0.5

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Foliar sprays	0	0	0	0	0	0	0
Fertiliser, lime and other	170	34	17	13	3	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	0	0	0	0	0	0	0
Rain/clover fixation	20	0	1	2	1	2	5

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	70	0.5	7	56	76	3	9
As product	14	3	1	2	7	0	0
As prunings	0	0	0	0	0	0	0
Transfer	0	0	0	0	0	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	51	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	145	-2	2	-29	1	0	0
Standing plant material	-71	-9	-40	-14	-51	-7	-5
Inorganic mineral	0	3	-19	0	-5	-7	-8
Crop framework	0	0	0	0	0	0	0
Inorganic soil pool	7	43	88	0	-20	15	11
Change in supplement storage	-18	-3	-22	-3	-6	-2	-2
Root and stover residuals	-8	-1	2	2	2	0	0

Blocks

Pasture

Pasture - Flat, 29.1 ha

N	24.1 kg/ha | 703 kg	P	0.3 kg/ha | 10 kg

BLOCK DETAILS

Area	29.1 ha	Average temp	10.2℃	Average rainfall	842 mm/yr	Annual PET	755 mm
Distance from coast	85 km						

SOILS

55%	CLAR_33A.1	28%	STEW_7A.1	17%	SELW_50A.1
16.01 ha	Pallic	8.15 ha	Brown	4.95 ha	Recent

PASTURE

Pasture growth	16,155 kg DM/ha/yr	Removed	2034 kg DM/ha/yr
Utilisation	76 %	Beef	12.64 rsu/ha
Intake	10,661 kg DM/ha/yr	Dairy grazing	6.63 rsu/ha

ARTIFICIAL DRAINAGE

Percentage drained	60%
Drainage method	Mole/tile system

SUPPLEMENTS

Harvested (DM)	59 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Flat	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Beef	-	0.6	0.69	1.47	1.54	1.64	1.15	1.06	1.11	1.89	1.07	0.42
Dairy grazing	1.32	0.3	-	-	-	-	-	-	-	-	-	5.01
FERTILISER APPLIED (KG/HA)												
N	-	41	19	28	15	15	13	29	32	10	-	-
P	-	-	22	-	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	1	-	-	-	-	-	2	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Clar_33a.1	-	16 ha (55%)	357 kg	22 kg/ha	10.2 ppm	180 kg/ha	201 kg/ha	6 kg	0.4 kg/ha	Low	Low	N/A
Stew_7a.1	-	8.15 ha (28%)	268 kg	33 kg/ha	13.7 ppm	180 kg/ha	201 kg/ha	2 kg	0.2 kg/ha	Low	Low	N/A
Selw_50a.1	-	4.95 ha (17%)	78 kg	16 kg/ha	8.3 ppm	180 kg/ha	201 kg/ha	2 kg	0.4 kg/ha	Low	Low	N/A

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Clar_33a.1	-	16 ha (55%)	114 mm	0 mm	624 mm	198 mm	102 mm	270 mm	96 mm	-	-	-	-
Stew_7a.1	-	8.15 ha (28%)	125 mm	0 mm	601 mm	126 mm	57 mm	198 mm	69 mm	-	-	-	-
Selw_50a.1	-	4.95 ha (17%)	99 mm	0 mm	652 mm	219 mm	81 mm	309 mm	138 mm	-	-	-	-

MODEL NOTES

Overview

Olsen P (39) is above that required for near maximum pasture production (30). See a consultant about reducing fertiliser P inputs. Note that on high producing dairy farms, target Olsen P levels are higher.

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

K input as supplements is contributing to increased soil K. Consider reducing other K inputs (see maintenance fertiliser requirements).

Selw_50a.1/No irrigation - 4.95 ha (17%)

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

The change in inorganic soil pool indicates that fertiliser nutrients can be reduced for Na

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 1 units
- No change in QT K test
- Increase in QT Mg test of 2 units

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 120 kg/ha/yr pure lime. Review soil pH and lime requirement.

Stew_7a.1/No irrigation - 8.15 ha (28%)

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 1 units
- No change in QT K test
- No change in QT Mg test

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 170 kg/ha/yr pure lime. Review soil pH and lime requirement.

Clar_33a.1/No irrigation - 16 ha (55%)

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 1 units
- No change in QT K test
- No change in QT Mg test

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 140 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	703	24.1
Phosphorus	10	0.3

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	0	0	0	0	0	0	0
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	0	0	0	0	0	0	0
Supplements fed on blocks	0	0	0	0	0	0	0
Rain/clover fixation	38	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	24.06	0.35	9	27	40.67	1.28	5.94
As product	19	5	1	2	10	0	1
Transfer	4	0	3	0	1	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	42.98	0	0	0	0	0	0
As supplements and crop residues	37	6	38	4	10	3	2

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	112.96	15.05	0	-6	0	0	0
Inorganic mineral	0	2.12	-25.72	0	-5.53	-9.21	-10.72
Inorganic soil pool	0	-5	10.27	0	-47.03	6.38	7.61

Pasture

Pasture - Flat, 10.4 ha

N	27.4 kg/ha | 287 kg	P	0.2 kg/ha | 3 kg

BLOCK DETAILS

Area	10.4 ha	Average temp	10.2℃	Average rainfall	842 mm/yr	Annual PET	755 mm
Distance from coast	85 km						

SOILS

69%	STEW_7A.1	31%	EURE_23A.1
7.18 ha	Brown	3.22 ha	Gley

PASTURE

Pasture growth	16,155 kg DM/ha/yr	Removed	2308 kg DM/ha/yr
Utilisation	76 %	Beef	12.38 rsu/ha
Intake	10,454 kg DM/ha/yr	Dairy grazing	6.49 rsu/ha

ARTIFICIAL DRAINAGE

Percentage drained	60%
Drainage method	Mole/tile system

SUPPLEMENTS

Harvested (DM)	24 tonnes

CROP MANAGEMENT

Block type	Pasture	Hydrophobic condition	Use default
Topography	Flat	Susceptibility to pugging	Occasional
Pasture type	Ryegrass/white clover	Is compacted	No
Cultivated in last 5 years	No	Naturally high water table	No
Animals present	Yes		

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA												
Beef	-	0.59	0.68	1.44	1.51	1.61	1.12	1.04	1.08	1.85	1.05	0.41
Dairy grazing	1.29	0.29	-	-	-	-	-	-	-	-	-	4.91
FERTILISER APPLIED (KG/HA)												
N	-	41	19	28	15	15	13	29	32	10	-	-
P	-	-	22	-	-	-	-	-	2	-	-	-
K	-	-	-	-	16	16	-	-	4	-	-	-
S	-	22	1	-	-	-	-	-	2	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Stew_7a.1	-	**7.18 ha (69%)**	234 kg	32 kg/ha	13.5 ppm	177 kg/ha	201 kg/ha	2 kg	0.2 kg/ha	Low	Low	N/A
Eure_23a.1	-	**3.22 ha (31%)**	53 kg	17 kg/ha	8.4 ppm	175 kg/ha	201 kg/ha	1 kg	0.3 kg/ha	Low	Low	N/A

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Stew_7a.1	-	**7.18 ha (69%)**	125 mm	0 mm	602 mm	126 mm	57 mm	198 mm	69 mm	-	-	-	-
Eure_23a.1	-	**3.22 ha (31%)**	102 mm	0 mm	645 mm	231 mm	105 mm	291 mm	126 mm	-	-	-	-

MODEL NOTES

Overview

Olsen P (39) is above that required for near maximum pasture production (30). See a consultant about reducing fertiliser P inputs. Note that on high producing dairy farms, target Olsen P levels are higher.

The change in inorganic soil pool indicates that additional fertiliser nutrients may be required to maintain production for Ca

Estimated change in soil test values for samples taken to 7.5cm:

- Decrease in Olsen P test of 2 units
- No change in QT K test
- No change in QT Mg test

K input as supplements is contributing to increased soil K. Consider reducing other K inputs (see maintenance fertiliser requirements).

Eure_23a.1/No irrigation - 3.22 ha (31%)

Soil P loss status is high. Consider reducing Olsen P levels.

Fertiliser P loss is greater than 10% of total P loss - this is outside the range of data available for New Zealand and P loss data should be used with caution. Potential P loss from fertiliser is high. Check fertiliser rates are not too high. If P is applied in high risk months consider alternative months of application or changing the form of P.

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 120 kg/ha/yr pure lime. Review soil pH and lime requirement.

Stew_7a.1/No irrigation - 7.18 ha (69%)

N losses from the root zone from this block exceed 11.3 ppm. This could contribute to high drinking water levels. The drinking water standard is 11.3 ppm. Note that the drinking water standard is not a environmental water quality standard, which is usually lower than the drinking water standard or a regulatory standard.Consider mitigation options to reduce this loss

Soil is slowly acidifying and would be neutralised by a maintenance lime application of 180 kg/ha/yr pure lime. Review soil pH and lime requirement.

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	287	27.4
Phosphorus	3	0.2

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	0	0	0	0	0	0	0
Fertiliser, lime and other	201	23	36	25	7	0	1
Irrigation	0	0	0	0	0	0	0
Supplements fed on blocks	0	0	0	0	0	0	0
Rain/clover fixation	38.69	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	27.35	0.23	9	26	43.28	1.69	6.07
As product	19	5	1	2	9	0	1
Transfer	4	0	3	0	1	0	0
Effluent exported	0	0	0	0	0	0	0
To atmosphere	41.48	0	0	0	0	0	0
As supplements and crop residues	42	7	43.31	4	11	3	2

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	107.86	12.31	0	-6	0	0	0
Inorganic mineral	0	4.69	-27	0	-4	-7	-8
Inorganic soil pool	0	-6	6	0	-51.97	3.31	3.93

Kale Winter 21 (ex swedes)

Crop - 13 ha

N	142.2 kg/ha | 1,857 kg	P	0.2 kg/ha | 3 kg

BLOCK DETAILS

Area	13 ha	Average temp	10.2°C	Average rainfall	842 mm/yr	Annual PET	755 mm
Distance from coast	85 km						

SOILS

69%	STEW_7A.1	31%	EURE_23A.1
8.97 ha	Brown	4.03 ha	Gley

ARTIFICIAL DRAINAGE

Percentage drained	60%
Drainage method	Mole/tile system

CROP MANAGEMENT

Block type	Crop	Crop rotation final month	June
Cultivated area	100 %	Years in pasture	10
Headlands and tracks	0 %	Prior land use	Grazed pasture
Other areas	0 %		

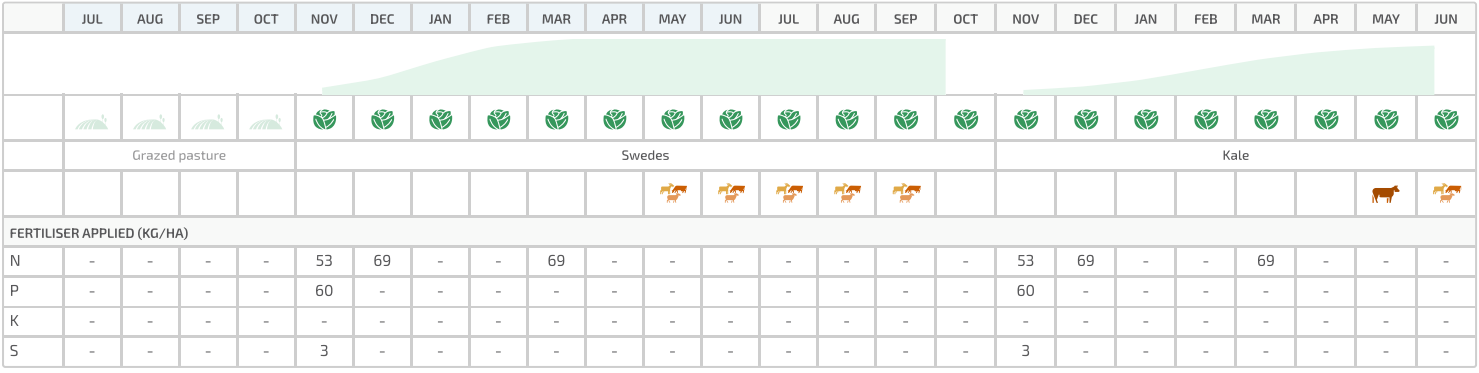
CROPS

Swedes

Category	Fodder
Crop type	Swedes
Sown	November - Year 1
Yield	182T
Cultivation practice at sowing	Conventional

Kale

Category	Fodder
Crop type	Kale
Sown	November - Reporting year
Yield	169T
Cultivation practice at sowing	Conventional



FERTILISER APPLIED (KG/HA)																							
N	-	-	-	-	53	69	-	-	69	-	-	-	-	-	-	-	53	69	-	-	69	-	-	-
P	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-
K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Stew_7a.1	-	**8.97 ha (69%)**	1,507 kg	167 kg/ha	53.7 ppm	265 kg/ha	190 kg/ha	1 kg	0.1 kg/ha	N/A	N/A	N/A
Eure_23a.1	-	**4.03 ha (31%)**	350 kg	87 kg/ha	33.6 ppm	265 kg/ha	190 kg/ha	2 kg	0.5 kg/ha	N/A	N/A	N/A

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Stew_7a.1	-	**8.97 ha (69%)**	162 mm	0 mm	530 mm	126 mm	57 mm	198 mm	69 mm	144 mm	66 mm	225 mm	78 mm
Eure_23a.1	-	**4.03 ha (31%)**	135 mm	0 mm	581 mm	231 mm	105 mm	291 mm	126 mm	591 mm	267 mm	705 mm	324 mm

MODEL NOTES

Eure_23a.1/No irrigation - 4.03 ha (31%)

Estimated change in soil test values for samples taken to 15cm:

- Increase in Olsen P test of 12 units
- Increase in QT K test of 2 units
- Increase in QT Mg test of 2 units

Stew_7a.1/No irrigation - 8.97 ha (69%)

Estimated change in soil test values for samples taken to 15cm:

- Increase in Olsen P test of 11 units
- Increase in QT K test of 2 units
- Increase in QT Mg test of 1 units

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	1,857	142.2
Phosphorus	3	0.2

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	0	0	0	0	0	0	0
Fertiliser, lime and other	190	60	0	3	0	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	82	14	93	10	24	7	5
Rain/clover fixation	2	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	142.2	0.4	4	94.31	136.47	4.69	13.07
As product	7	2	0	1	4	0	0
Transfer	3	0	2	0	1	0	0
To atmosphere	59.13	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	228.24	-22	0	-56	0	0	0
Standing plant material	-189	-23	-108	-30	-113	-16	-10
Inorganic mineral	0	4.69	-12	0	-4	-7	-8
Inorganic soil pool	49.74	115.31	203	0	-5.47	26.31	13.93
Root and stover residuals	-26.31	-3	4	5	6	0	0

Kale Winter 21 (ex swedes)

Crop - 17 ha

N	125.2 kg/ha | 2,141 kg	P	0.5 kg/ha | 9 kg

BLOCK DETAILS

Area	17 ha	Average temp	10.2℃	Average rainfall	838 mm/yr	Annual PET	755 mm
Distance from coast	60 km						

SOILS

55%	CLAR_33A.1	28%	STEW_7A.1	17%	SELW_50A.1
9.35 ha	Pallic	4.76 ha	Brown	2.89 ha	Recent

ARTIFICIAL DRAINAGE

Percentage drained	60%
Drainage method	Mole/tile system

CROP MANAGEMENT

Block type	Crop	Crop rotation final month	June
Cultivated area	100 %	Years in pasture	10
Headlands and tracks	0 %	Prior land use	Grazed pasture
Other areas	0 %		

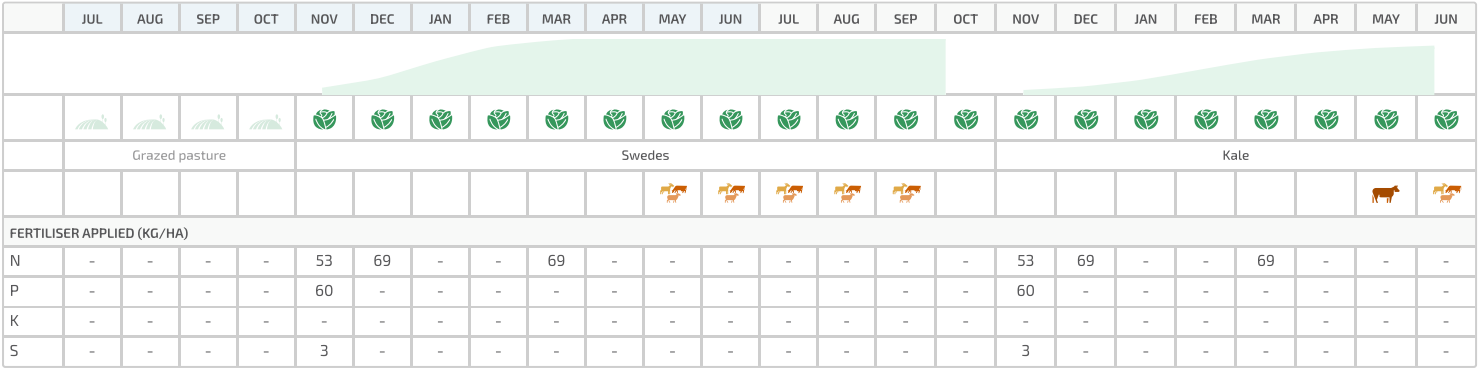
CROPS

Swedes

Category	Fodder
Crop type	Swedes
Sown	November - Year 1
Yield	238T
Cultivation practice at sowing	Conventional

Kale

Category	Fodder
Crop type	Kale
Sown	November - Reporting year
Yield	221T
Cultivation practice at sowing	Conventional



FERTILISER APPLIED (KG/HA)	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
N	-	-	-	-	53	69	-	-	69	-	-	-	-	-	-	-	53	69	-	-	69	-	-	-
P	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-
K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Clar_33a.1	-	9.35 ha (55%)	1,119 kg	119 kg/ha	42.3 ppm	264 kg/ha	190 kg/ha	7 kg	0.7 kg/ha	N/A	N/A	N/A
Stew_7a.1	-	4.76 ha (28%)	796 kg	166 kg/ha	53.8 ppm	264 kg/ha	190 kg/ha	1 kg	0.1 kg/ha	N/A	N/A	N/A
Selw_50a.1	-	2.89 ha (17%)	226 kg	78 kg/ha	31.1 ppm	264 kg/ha	190 kg/ha	1 kg	0.3 kg/ha	N/A	N/A	N/A

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Clar_33a.1	-	9.35 ha (55%)	146 mm	0 mm	556 mm	198 mm	102 mm	270 mm	96 mm	198 mm	102 mm	270 mm	96 mm
Stew_7a.1	-	4.76 ha (28%)	160 mm	0 mm	530 mm	126 mm	57 mm	198 mm	69 mm	144 mm	66 mm	225 mm	78 mm
Selw_50a.1	-	2.89 ha (17%)	130 mm	0 mm	588 mm	219 mm	81 mm	309 mm	138 mm	534 mm	198 mm	759 mm	336 mm

MODEL NOTES

Selw_50a.1/No irrigation - 2.89 ha (17%)

Estimated change in soil test values for samples taken to 15cm:

- Increase in Olsen P test of 12 units
- Increase in QT K test of 2 units
- Increase in QT Mg test of 2 units

Stew_7a.1/No irrigation - 4.76 ha (28%)

Estimated change in soil test values for samples taken to 15cm:

- Increase in Olsen P test of 11 units
- Increase in QT K test of 2 units
- Increase in QT Mg test of 1 units

Clar_33a.1/No irrigation - 9.35 ha (55%)

Estimated change in soil test values for samples taken to 15cm:

- Increase in Olsen P test of 12 units
- Increase in QT K test of 2 units
- Increase in QT Mg test of 1 units

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	2,141	125.2
Phosphorus	9	0.5

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	0	0	0	0	0	0	0
Fertiliser, lime and other	190	60	0	3	0	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	82	14	93	10	23	7	5
Rain/clover fixation	2	0	1	3	1	3	9

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	125.19	0.67	4	95.55	122.75	4.28	12.22
As product	7	2	0	1	4	0	0
Transfer	3	0	2	0	1	0	0
To atmosphere	65.38	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	229.17	-22.55	0	-56	0	0	0
Standing plant material	-189	-23	-108	-30	-113	-16	-10
Inorganic mineral	0	1.95	-14.71	0	-4.02	-5.53	-6.7
Inorganic soil pool	60.43	117.33	205.71	0	8.1	27.25	17.93
Root and stover residuals	-26.17	-3	4	5	6	0	0

Swedes Winter 20 (into grass)

Crop - 7 ha

N	90.7 kg/ha | 646 kg	P	0.3 kg/ha | 2 kg

BLOCK DETAILS

Area	7 ha	Average temp	10.2℃	Average rainfall	842 mm/yr	Annual PET	755 mm
Distance from coast	85 km						

SOILS

55%	CLAR_33A.1	28%	STEW_7A.1	17%	SELW_50A.1
3.85 ha	Pallic	1.96 ha	Brown	1.19 ha	Recent

PASTURE

Pasture growth	10,404 kg DM/ha/yr	Removed	0 kg DM/ha/yr
Utilisation	70 %	Beef	12.63 rsu/ha
Intake	7,282 kg DM/ha/yr	Dairy grazing	0.55 rsu/ha

ARTIFICIAL DRAINAGE

Percentage drained	60%
Drainage method	Mole/tile system

CROP MANAGEMENT

Block type	Crop	Crop rotation final month	June
Cultivated area	100 %	Years in pasture	10
Headlands and tracks	0 %	Prior land use	Grazed pasture
Other areas	0 %		

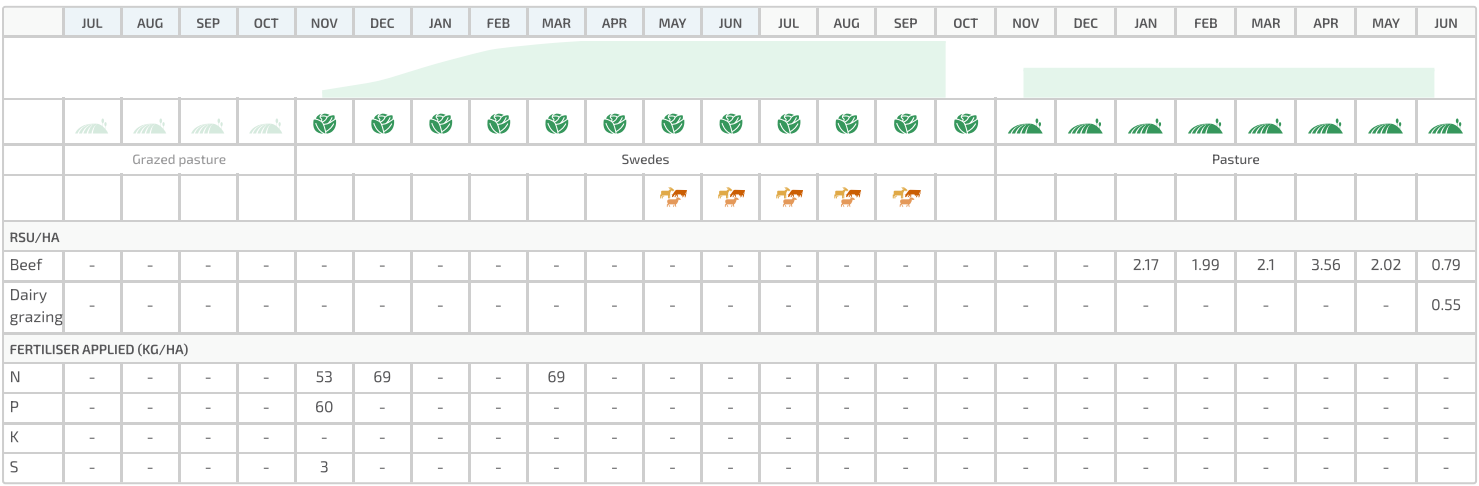
CROPS

Swedes

Category	Fodder
Crop type	Swedes
Sown	November - Year 1
Yield	98T
Cultivation practice at sowing	Conventional

Pasture

Category	Permanent pasture
Crop type	Pasture
Sown	November - Reporting year
Cultivation practice at sowing	Conventional
Defoliation management	Grazing only



	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
RSU/HA																								
Beef	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.17	1.99	2.1	3.56	2.02	0.79
Dairy grazing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.55
FERTILISER APPLIED (KG/HA)																								
N	-	-	-	-	53	69	-	-	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SOIL/IRRIGATION - RESULTS

			NITROGEN					PHOSPHORUS				
SOIL	IRRIGATOR	AREA	TOTAL LOST	LOST	DRAINAGE [1]	SURPLUS	ADDED [2]	TOTAL LOST	LOST	SOIL P LOSS RISK	FERT P LOSS RISK	EFF P LOSS RISK
Clar_33a.1	-	3.85 ha (55%)	328 kg	84 kg/ha	32.1 ppm	18 kg/ha	0 kg/ha	2 kg	0.4 kg/ha	N/A	N/A	N/A
Stew_7a.1	-	1.96 ha (28%)	247 kg	123 kg/ha	43.1 ppm	17 kg/ha	0 kg/ha	0 kg	0.1 kg/ha	N/A	N/A	N/A
Selw_50a.1	-	1.19 ha (17%)	71 kg	59 kg/ha	24.7 ppm	18 kg/ha	0 kg/ha	0 kg	0.2 kg/ha	N/A	N/A	N/A

1 - N concentration due to leaching in drainage water at the bottom of the root zone.

2 - N added as fertiliser, effluent and organic only

SOIL/IRRIGATION - OTHER VALUES

						TO 60CM				TO 150CM			
SOIL	IRRIGATOR	AREA	DRAINAGE	RUNOFF	AET	FIELD CAPACITY	WILTING POINT	SATURATION	PAW	FIELD CAPACITY	WILTING POINT	SATURATION	PAW
Clar_33a.1	-	3.85 ha (55%)	136 mm	0 mm	580 mm	198 mm	102 mm	270 mm	96 mm	198 mm	102 mm	270 mm	96 mm
Stew_7a.1	-	1.96 ha (28%)	149 mm	0 mm	556 mm	126 mm	57 mm	198 mm	69 mm	144 mm	66 mm	225 mm	78 mm
Selw_50a.1	-	1.19 ha (17%)	124 mm	0 mm	605 mm	219 mm	81 mm	309 mm	138 mm	534 mm	198 mm	759 mm	336 mm

MODEL NOTES

Selw_50a.1/No irrigation - 1.19 ha (17%)

Estimated change in soil test values for samples taken to 15cm:

- Increase in Olsen P test of 2 units
- No change in QT K test
- Increase in QT Mg test of 2 units

Stew_7a.1/No irrigation - 1.96 ha (28%)

Estimated change in soil test values for samples taken to 15cm:

- Increase in Olsen P test of 2 units
- No change in QT K test
- Increase in QT Mg test of 1 units

Clar_33a.1/No irrigation - 3.85 ha (55%)

Estimated change in soil test values for samples taken to 15cm:

- Increase in Olsen P test of 2 units
- No change in QT K test
- Increase in QT Mg test of 1 units

NUTRIENT BUDGET

LOSSES FROM ROOT ZONE

	TOTAL LOSS (KG/YR)	LOSS PER HA (KG/YR)
Nitrogen	646	90.7
Phosphorus	2	0.3

NUTRIENTS ADDED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Effluent added	0	0	0	0	0	0	0
Fertiliser, lime and other	0	0	0	0	0	0	0
Irrigation	0	0	0	0	0	0	0
Supplements	42	8	53	6	13	4	4
Rain/clover fixation	2	0	1	2	1	2	4

NUTRIENTS REMOVED (KG/HA/YR)	N	P	K	S	CA	MG	NA
Leaching, runoff and direct losses	90.67	0.44	4	82.28	84.28	1.83	9.94
As product	21.28	5	1	2.83	10.83	0	1
Transfer	5	1	4	1	2	0	0
To atmosphere	70.46	0	0	0	0	0	0
As supplements and crop residues	0	0	0	0	0	0	0

CHANGE IN POOLS (KG/HA/YR)	N	P	K	S	CA	MG	NA
Organic pool	-8.5	-17	0	-58	0	0	0
Standing plant material	4	-4	0	-26	-104.28	-7.28	-14.28
Inorganic mineral	0	0.84	-17.16	0	-5.53	-9.21	-10.72
Inorganic soil pool	-154.18	19.44	50.16	0	25.81	18.83	21.06
Root and stover residuals	14.44	2.17	10.72	6	2	1	0