Irricon resource solutions

OVERSEER Nutrient Budget Review

For: Environment Southland – Cashmere Bay Dairies Ltd

Prepared by: Nicky Watt, CNMA

Date: 29th October 2021

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Introduction

1. Regarding the consent application for Cashmere Bay Dairies Ltd, I have reviewed the following OVERSEER ® Nutrient Budget (OVERSEER) files:
   a) Year Ending 2020
   b) Year End 20 Support 1
   c) Year End 20 Support 2
   d) Proposed Milking Platform
   e) Proposed Support 1

2. Along with the files I have reviewed the following accompany report: "OverseerFM farm system modelling to support a consent application for expanded dairy" prepared by Miranda Hunt, Roslin Consultancy Ltd and reviewed by Mo Topham, AgriAce. I have completed a robustness check on the file for sensibility based on data available and checked to ensure the modelling aligns with the OVERSEER Best Practice Data Input Standards for v6.4.1.

3. It must be assumed that the information provided in the OVERSEER files that the current farming system as modelled is a viable farming system, using actual stock and fertiliser inputs. Therefore, the actual and proposed scenario is also assumed to be appropriate for the location and climate.

4. A 'sensibility test' has been undertaken on the Cashmere Bay Dairies Ltd nutrient budgets with the following five output screens from OVERSEER forming the basis of the determination of the robustness of the nutrient budget:

   a) Is the nutrient loss consistent with what you would expect for an operation of this type and soils in this location?

   b) Does the summary of inputs and outputs make sense? Especially clover fixation and change in block pools?

   c) Check the 'Other values' block reports for rainfall, drainage, and PAW.

   d) Select the Scenario reports other values and check the production and stocking rate.

   e) Select the pasture production in the scenario report and check pasture growth.

5. Answers to each of these five points will be provided further in this report and then a final determination of the robustness of the nutrient loss to water will be provided at the end of this report.

OVERSEER AUDIT

Appropriateness of the Overseer inputs

1. The Overseer FM files submitted and stated in paragraph 1 of this report have been reviewed for consistency between the files and appropriateness of the inputs regarding the farming systems and the Overseer Best Practice Data Input Standard (BPDIS).

2. I concur that there are no deviations from the BPDIS

3. The YE 2020 models and Proposed models have a total area of 52.9 ha with 510.5 ha effective (459 ha in pasture and 51.5 ha in crop). The YE 2020 combined models have a revised stocking rate of 31.3 RSU/ha for dairy cows and the Proposed combined models have a revised stocking rate of 34.9 RSU/ha or a 10.3% increase in RSU/ha (see Table 1 and 1a below).

4. Reviewing the NZ Dairy statistics for the 2019/2020 season, shows the average milk solids production on this property for the YE 20 model at 470.9 kgMS/cow and 1354 kgMS/ha is respectively higher than the Southland Regional average of 418 kg MS/cow and higher than the Southland Regional average of 1133 kgMS/ha. The Prop MP model at 467.7 kgMS/cow and 1328 kgMS/ha is respectively higher than the Southland Regional average of 418 kg MS/cow and higher than the Southland Regional average of 1133 kgMS/ha.

5. The stocking rate for YE 20 and Prop MP models at 2.87 and 2.8 cows/ha are respectively greater than the Southland average for the 2019/2020 season of 2.76 cows/ha (Invercargill).

Table 1: Summary of Production and stocking rate

	YE 20[1]	YE 20 S1[2]	YE 20 S2[3]	Prop MP[4]	Prop S[5]
Total Ha	353	89.6	80.3	433.3	89.6
Effective Area (ha)	344.4	89.6	76.5	420.9	89.6
Effective Pasture Area (ha)	336.4	83.6	39.5	376.9	82.1
KgMS	466192	-	-	558600	-
MS kg/ha grazed	1354	-	-	1328	-
MS kg MS/cow	470.9	-	-	467.4	-
Dairy RSU	10515	-	-	13155	-
RSU/ha (effective pasture area)	31.3	-	-	34.9	-
Lactation Length	266	-	-	266	-
Cows/ha	2.87	-	-	2.8	-
Cows October	990	-	-	1140	-
Cows June	400	--	600	1195	
Cows July	400		600	1195	
Yearlings June	-	210	-	-	265
Yearlings July	-	210	-	-	265
Replacement RSU	67	-	-	183	-
Dairy Grazing RSU	-	1467	755	-	1676
Dairy Grazing RSU/ha (Eff past)	-	17.5	19.1	-	20.4
Irrigation Pivot (ha)	28.7	-	-	28.7	-
Irrigation LRR (ha)	122	-	-	122	-
Irrigation SRR (ha)	37	-	-	37	-
N lost kg/ha/yr	51	24	47	45	26

[1]Year Ending 2020 – YE 20
[2]Year End 20 Support 1- YE 20 S1
[3]Year End 20 Support 2 – YE 20 S2
[4]Proposed Milking Platform – Prop MP
[5]Proposed Support 1 – Prop S

Table 1a: Total Figures for Year End 2020 and Proposed

	Year end 2020	Proposed
Total Ha	522.9	522.9
Effective Area (ha)	510.5	510.5
Effective Pasture Area (ha)	459	459
KgMS	466192	558600
MS kg/ha grazed	1354	1328
MS kg MS/cow	470.9	467.4
Dairy RSU	10515	13155
RSU/ha (effective pasture area)	31.3	34.9
Lactation Length	266	266
Cows/ha	2.87	2.8
Cows October	990	1140
Cows June	1000	1195
Cows July	1000	1195
Yearlings June/July	210	265
N lost kg/ha/yr	45.9	41.9

6. During the YE 2020 models there was 14 ha of fodder beet 'rotation' and 37 ha of swede crop. There was 7.5 ha fodder beet 'rotation' with 44ha Swede 'rotation' in the Proposed models (see Table 2 and 2a below).

Table 2: Crop Details

	YE 20	YE S1	YE S2	Prop MP	Prop S1
Fodder Beet (ha)- Rotation	8	6	-		7.5
Fodder Beet Yield (tDM/ha)	25	25	-		25
When grazed	May to Aug	May to Aug	-		May to Aug
Grazed by	Dairy Cows	Dairy Grazing	-		Dairy Grazing
Swedes (ha) - Crop			37		
Swedes Yield (tDM/ha)			16		
When grazed			May to Sept		
Grazed by			Dairy grazing/Beef		
Swedes (ha) - Rotation		-	-	44	
Swedes Yield (tDM/ha)		-	-	16	
When grazed		-	-	May to Aug	
Grazed by		-	-	Dairy Cows	

Table 2a: Total Crop Details for Year End 2020 and Proposed

	YE 2020	Proposed
Fodder Beet (ha)- Rotation	14	7.5
Fodder Beet Yield (tDM/ha)	23-25	25
When grazed	May to Aug	May to Aug
Grazed by	Dairy Cows	Dairy Grazing
Swedes (ha) - Crop	37	
Swedes Yield (tDM/ha)	16	
When grazed	May to Sept	
Grazed by	Dairy grazing/Beef	
Swedes (ha) - Rotation		44
Swedes Yield (tDM/ha)		16
When grazed		May to Aug
Grazed by		Dairy Cows

7. The soils for YE 2020 and the Proposed models were compared as shown in Table 3 below. There is no difference between models

Table 3: Soil Details for Year End 2020 and Proposed

	YE 2020	Proposed
Selw_50a	163.9	163.9
Stew_7a	155.2	155.2
Eure_23a	52.9	52.9
Clar_33a	100.8	100.8
Balm_21a	23.1	23.1
Pyr2_2a	10.6	10.6
Eure_20a	4	4

8. Supplements imported to meet cow demand (see Table 4 below). Pasture silage has been made where there was a surplus of pasture.

9. The YE 2020 models have a combined pasture growth calculated at 17.1 tDM/ha for dairy area and 14.7 tDM/ha for the dairy support area and the Proposed models have a combined pasture growth of 16.3 tDM/ha for dairy pasture and 14.4 tDM/ha for the dairy support. This is a decrease of 4.7% decrease in pasture growth for the dairy pasture and 2.0 % decrease for dairy support pasture. The N used on all pasture blocks in the YE 2020 models combined was 270 kgN/ha for

dairy and 251 kgN/ha for the dairy support compared to 189 kgN/ha for the dairy and dairy support in the combined Proposed models (a respective 30% and 24.7% drop in N applied to pasture). There is expected to be 36% more supplement imported and 37% less silage harvested in the combined Proposed models compared to the combined YE 2020 models (see Table 4 and 4a below).

Table 4: Supplements imported and Harvested

	YE 20	YE S1	YE S2	Prop MP	Prop S1
Supplements Imported (tDM)	847	-	187	1615	-
Supplements Imported Effective Area (tDM/ha)	2.52	-	4.73	4.28	-
Silage Harvested (tDM)	120	178	62	-	120
Silage Harvested Pasture (tDM/ha)	0.36	2.13	1.57	-	1.46
Total Area (ha)	353	89.6	80.3	433.3	89.6
Effective Area (ha)	344.4	89.6	76.5	420.9	89.6
Effective Pasture Area (ha)	336.4	83.6	39.5	376.9	82.1
RSU/ha (effective pasture area)	31.3	-	-	34.9	-
Peak Cows/ha	2.87	-	-	2.8	-
Replacement RSU	67	-	-	183	-
Dairy Grazing RSU	-	1467	755	-	1676
Dairy Grazing RSU/ha (Eff past)	-	17.5	19.1	-	20.4
N Fertiliser applied non -effluent area(kgN/ha)	270	-	-	189	-
N Fertiliser applied effluent Area (kgN/ha)	270	-	-	189	-
N Fertiliser applied to support area (kgN/ha)	-	249	257	-	189
Pasture Growth support area (tDM/ha)	-	15.1	13.8	-	14.4
Pasture Growth dairy area (tDM/ha)	17.1	-	-	16.3	-

Table 4a: Total Supplement for Year End 2020 and Proposed

	YE 2020	Proposed
Supplements Imported (tDM)	1034	1615
Supplements Imported Effective Area (tDM/ha)	2.25	4.28
Silage Harvested (tDM)	360	120
Silage Harvested Pasture (tDM/ha)	0.78	1.46
Total Area (ha)	522.9	522.9
Effective Area (ha)	510.5	510.5
Effective Pasture Area (ha)	459	459
RSU/ha (effective pasture area)	31.3	34.9
Peak Cows/ha	2.87	2.8
Replacement RSU	67	183
Dairy Grazing RSU	2222	1676
Dairy Grazing RSU/ha (Eff past)	18.1	20.4
N Fertiliser applied non -effluent area(kgN/ha)	270	189
N Fertiliser applied effluent Area (kgN/ha)	270	189
N Fertiliser applied to support area (kgN/ha)	251	189
Pasture Growth support area (tDM/ha)	14.7	14.4
Pasture Growth dairy area (tDM/ha)	17.1	16.3

Overseer Outputs

10. The combined N lost to water for the YE 2020 models was 45.9 kgN/ha/yr (23999 kgN/annum) compared to 41.9 kgN/ha/yr (21907 kgN/annum) for the combined Proposed models which is an 8.7 % reduction in total N loss. The combined P lost for the YE 2020 models was 0.77 kgP/ha/yr (405 kgP/annum) compared to 0.73 kgP/ha/yr (384 kgP/annum) for the combined Proposed models which is a 5.2% reduction in total P loss. (see Table 5 below). It is assumed that the information provided in this farming system is modelled as a viable farming system, using actual stock and fertiliser inputs.

Table 5: OVERSEER outputs

Overseer v6.4.1	YE 20	YE S1	YE S2	Prop MP	Prop S1
N lost to water kg/ha/yr	51	24	47	45	26
Total N lost kg/farm	18053	2186	3760	19563	2344
P lost kg/ha/yr	0.9	0.3	0.5	0.8	0.3
Total P lost kg/farm	333	32	40	357	27
Other sources – N	319	14	15	355	14
Other sources – P	173	9	17	198	9

Table 5a: Total OVERSEER outputs between Year End 2020 and Proposed

Overseer v6.4.1	YE 2020	Proposed
N lost to water kg/ha/yr	45.9	41.9
Total N lost kg/farm	23999	21907
P lost kg/ha/yr	0.77	0.73
Total P lost kg/farm	405	384
Other sources – N	348	369
Other sources – P	199	207

Change in block pools

11. The organic pool for N indicates the amount of N that is being either immobilized as seen by a 'positive' Organic pool N value or being mineralized as seen by a 'negative' Organic pool N value. N being immobilized is being used for increased biological activity and temporarily locked up. Once the microorganisms die the organic N in their cells is converted by mineralization and nitrification to plant available nitrate. It appears N is potentially being immobilized in all models (see Table 6 below).

12. The inorganic soil pool for P indicates the amount P that exceeds soil P maintenance as seen by a 'positive' inorganic soil P value or is less than the soil P maintenance requirements as seen by a 'negative' inorganic soil P value. Above maintenance P was applied to YE models and slightly above maintenance levels for the Proposed model (see Table 6a below).

Table 6: Change in block pool (N)

	YE 20	YE S1	YE S2	Prop MP	Prop S1
Organic Pool	129	131	149	101	100
Inorganic Mineral	0	0	0	0	0
Inorganic Soil Pool	5	11	74	21	14

Table 6a: Change in block pool (P)

	YE 20	YE S1	YE S2	Prop MP	Prop S1
Organic Pool	13	13	-7	10	12
Inorganic Mineral	2	2	2	2	1
Inorganic Soil Pool	10	20	63	9	6

Rain/clover N Fixation

All plants, including forage crops, need relatively large amounts of nitrogen for growth and development. Biological nitrogen fixation is the term used for a process in which nitrogen gas (N2) from the atmosphere is incorporated into the tissue of certain plants. Only a select group of plants can obtain N this way, with the help of soil microorganisms. Among forage plants, the group of plants known as legumes (predominantly Clover in NZ pastures) are well known for being able to obtain N from air N2. The OVERSEER Technical Manual – Characteristics of Pasture, April 2015 indicates that biological N fixation is based on total pasture production and includes the fertiliser induced reduction in N fixation.

13. The Biological fixation for the combined YE Models is 48 compared to the combined Proposed models at 69 (see table 7a below).

14. The N added to pasture for the combined YE models was 265 kgN/ha compared to 189 kgN/ha for the combined Proposed models (a 28.7 % drop in N used).

15. The increase in biological fixation in the Proposed model can be explained by the almost 29% decrease in N fertiliser applied.

Table 7: Biological fixation

	YE 20	YE S1	YE S2	Prop MP	Prop S1
Biological Fixation (kg/ha/yr)	58	21	21	77	31
Average N applied to whole farm kg/ha/yr	262 (270 to all pasture)	242 (249 to all pasture)	178 (257 to all pasture)	184 (189 to all pasture)	186 (189 to all pasture)

Table 7a: Biological fixation between Year End 2020 and Proposed

	YE 20	Prop MP
Biological Fixation (kg/ha/yr)	48	69
Average N applied to pasture kg/ha/yr	265	189

Pasture Production

16. The average effluent N inputs for the YE 2020 models was 55kgN/ha from liquid to 187.7 ha of pasture/crop and 13 kgN/ha from solid effluent to 344.4 ha pasture/crop (see table 8 below). The average effluent N inputs for Proposed models was 49 kgN/ha from liquid to 264.2 ha of pasture/crop and 13 kgN/ha from solid effluent to 420.9 ha pasture/crop.

17. Fertiliser inputs of N, for the YE 2020 models combined, to effluent and non-effluent pasture was 270 kgN/ha. The combined fertiliser inputs of N to pasture onto effluent and non-effluent area was 189 kgN/ha pasture in the Proposed models.

18. Liquid effluent is applied onto pasture block for all the models was applied all year-round using a <12 mm application method. Solids effluent from pond is applied in Jan for all the models.

Table 8: Pasture production and N inputs (fertiliser and effluent)

	YE 2020	Proposed
Effluent Liquid Area (ha)	187.7	264.2
Effluent Solids Area (ha)	344.4	420.9
Pasture Growth (tDM/ha/yr)		
Effluent	17.1	16.3
Non-Effluent	17.1	16.3
Support	14.7	14.4
N Fertiliser inputs (kg/ha/yr)		
Effluent	270	189
Non-Effluent	270	189
N Effluent Inputs (kg/ha/yr)		
Effluent	55	49
Non-effluent (includes solids)	13	13
Total N Inputs (kgN/ha/yr)		
Effluent	325	238
Non-Effluent	283	202

19. The pasture production for all models has been modelled as varying based on topography, climate, and development status.

20. Fertiliser inputs of N are high for the YE 2020 models compared to moderate for the Proposed Model (see Table 8).

21. It is assumed the YE 2020 models represent the actual farm system with actual stock, crop area and fertiliser inputs, it is assumed that the pasture production is accurate and reasonable.

22. Long term pasture growth in Southland between 1979 and 2012 indicated that average pasture growth for newer pastures was 12.7T DM/ha/yr.

23. The dairy pasture production for the YE 20 model was 17.1 tDM/ha compared to 16.3 tDM/ha for the Proposed models which is respectively 25.7% and 22.1% higher than the Southland average (see Tables 4, 4a and 8 above).

24. YE 20 model: Allowing for the Overseer model assuming an average metabolisable energy (ME) value of 10.5 MJME/kgDM for pasture and South Island pastures have a ME value closer to 11 MJME/kgDM the models output of pasture growth would drop by 4.5%. Also, the YE 20 model has used actual data and have been rotating crops which means new pasture which can account for 15-20% improvement in pasture growth. Also 2.8 tDM/ha would come from the high N fertiliser applied (270 kgN/ha X 12 kgDM/kgN applied). This more than accounts for the high pasture growth.

25. Prop MP model: The drop in pasture growth can be accounted for in the large drop in N fertiliser applied and increase in supplement imported.

26. The animal distribution is modelled as 'No difference between blocks' and 'Same ratio of animal intake' with 'Default Grazing Months' for all models.

Mitigations Modelled

27. Reporting out lined the following: As described in the Nutrient Budget Report for Cashmere Bay Dairies Ltd prepared Miranda Hunt, Roslin Consultancy Ltd (page 13 of the 'OverseerFM farm consultancy modelling to support a consent application for expanded dairy' document), there are several mitigation measures indicated to mitigate N loss that have been included in the Proposed modelling. The below table details if the mitigation measures have been included in the proposed scenario and if they are accurately modelled.

Table 9: Mitigation option for Proposed scenario

Wintering spread over a larger area	Yes, if include just June and July as wintering, however intensive winter grazing is from May to end of September, so the area used for intensive winter grazing is over the combined effective area of 510.5ha for YE 2020 and Proposed Models. The numbers of animals wintered have increased from 1210 (1000 cows + 210 yearling heifers) in YE 2020 models to 1460 (1195 cows and 265 yearling heifers) in the Proposed models. This is a 17% increase in numbers over June/July

Decrease in N applied	Yes, N fertiliser applied to pasture decreased from 270 kgN/ha for the YE 20 model compared to 189 kgN/ha for the Prop MP model (a 30% decrease). Also, N applied to the support block pasture has decreased from 251 kgN/ha to 189 kgN/ha (a 24.7 % decrease in N applied).
Reducing the farm average Olsen P to 30	Yes, the drop in Olsen P to 30 has been modelled, however P applied is slightly above maintenance P levels in the Proposed models.
Change in fertiliser timing	*Removal of N fertiliser applied in May and P fertiliser no longer applied in September and moved to December in Prop MP and Prop 1.*
Removal of beef animals	Yes, the beef calves grazed November to end of March have gone from the YE 20 S1 model and just 9 bulls from October to January are in the Prop S1 model.
Imported supplement	*Imported supplement has increase from 2.25 tDM/ha to 4.28 tDM/ha, a 47.4% increase.*

28. All mitigations identified in the OverseerFM report have been mostly modelled correctly. The stocking rate (if use RSU/ha) has increased and there are 25% more wintered on farm.

29. I have added 'change in fertiliser timing' and 'imported supplement', which are mitigations I have added and not mentioned as mitigations in the OverseerFM Modelling Report, as they can have an impact on N loss.

30. It is important that these mitigation measures are measured and monitored as if they are not adhered to the N loss reductions proposed may not occur.

31. Some good management practices assumed in Overseer are maintain accurate and auditable records of annual farm inputs, outputs and management practices (Overseer output is only as good as the data entered); Fertiliser is being applied according to the Fertmark and Spreadmark Codes of Practice; Feed is stored to minimise leachate and soil damage; Compliant effluent systems as defined by DairyNZ; Stock exclusion from water ways; Irrigation efficiency greater than 80%; farm race and bridge/culvert nutrient runoff is directed to paddocks; grazing managed to minimise losses from critical source areas.

32. Overseer will account for bad practices such as nitrogen (N) applied that exceeds the plants' ability to absorb the excess N, application of N in the winter, high stocking rates, land left fallow between crops and irrigating high water application rates causing N drainage to name a few.

33. The Overseer modelling completed for this farm does not have any of the 'Bad Practices' as suggested in paragraph 31, and it would be assumed the FEMP would cover any good management practices (not limited to) outlined in paragraph 30.

CONCLUDING COMMENTS

Determination of the robustness of the nutrient loss to water

34. The questions below were described at Paragraph five of this report. Whilst these have been answered throughput this report, this section summarizes the answer to each question to make an overall conclusion about the robustness of the nutrient budgets.

Is the N loss consistent with what you would expect for an operation of this type and soils in this location?

35. Based on my experience, the N loss estimates are reasonably consistent with an operation of this scale and soil types present.

Does the summary of inputs and outputs make sense? Especially clover fixation and change in block pools?

36. The Biological fixation for the combined YE Models is 48 compared to the combined Proposed models at 69.

37. The N added to pasture for the combined YE models was 265 kgN/ha compared to 189 kgN/ha for the combined Proposed models (a 28.7 % drop in N used).

38. The increase in biological fixation in the Proposed model can be explained by the almost 29% decrease in N fertiliser applied.

Check the 'Other values' block reports for rainfall, drainage, and PAW.

39. The rainfall and soil information have been entered based on protocols for the location and soil type selected. YE 2020 model's soils areas are within 5% of Proposed models soils.

Production and stocking rate

40. The YE 2020 combined models have a revised stocking rate of 31.3 RSU/ha for dairy cows and the Proposed combined models have a revised stocking rate of 34.9 RSU/ha or a 10.3% increase in RSU/ha (see Table 1 and 1a below).

41. Based on my experience as well as reviewing NZ Dairy statistics for the 2019/2020 season, the average milk solids production on this property for the YE 20 model at 470.9 kgMS/cow and 1354 kgMS/ha is respectively higher than the Southland Regional average of 418 kg MS/cow and higher than the Southland Regional average of 1133 kgMS/ha. The Prop MP model at 467.7 kgMS/cow and 1328 kgMS/ha is respectively higher than the Southland Regional average of 418 kg MS/cow and higher than the Southland Regional average of 1133 kgMS/ha.

42. The stocking rate for YE 20 and Prop MP models at 2.87 and 2.8 cows/ha are respectively greater than the Southland average for the 2019/2020 season of 2.76 cows/ha (Invercargill).

43. It is assumed that the YE 2020 models are based on actual year end information.

Select the pasture production in the scenario report and check pasture growth.

44. Long term pasture growth in Southland between 1979 and 2012 indicated that average pasture growth for newer pastures was 12.7T DM/ha/yr.

45. The dairy pasture production for the YE 20 model was 17.1 tDM/ha compared to 16.3 tDM/ha for the Proposed models which is respectively 25.7% and 22.1% higher than the Southland average (see Tables 4, 4a and 8 above).

46. YE 20 model: Allowing for the Overseer model assuming an average metabolisable energy (ME) value of 10.5 MJME/kgDM for pasture and South Island pastures have a ME value closer to 11 MJME/kgDM the models output of pasture growth would drop by 4.5%. Also, the YE 20 model has used actual data and have been rotating crops which means new pasture which can account for 15-20% improvement in pasture growth. Also 2.8 tDM/ha would come from the high N fertiliser applied (270 kgN/ha X 12 kgDM/kgN applied). This more than accounts for the high pasture growth.

47. Prop MP model: The drop in pasture growth can be accounted for in the large drop in N fertiliser applied and increase in supplement imported.

48. I have assumed an adequate level of robustness around the YE 2020 Models of actual Overseer Modelling as it is based on an actual farming system, and with that, I have assumed actual stock and fertiliser inputs used.

    The data input protocols have been followed with no deviations. This leads to high level of robustness for the relevant input data for example, climate, soils, and pasture type. Based on this, I consider that the robustness of the nutrient loss estimates for the Proposed model to be **high,** this is due to the following:

<u>Summary of Mitigations to address:</u>

Please explain why:

- The numbers of animals wintered have increased from 1210 (1000 cows + 210 yearling heifers) in YE 2020 models to 1460 (1195 cows and 265 yearling heifers) in the Proposed models. This is a 17% increase in numbers over June/July.
- How the Olsen p levels will drop allowing the P fertiliser applied slightly exceeds maintenance P requirements.

References:

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