



Draft for discussion purposes

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Sheep and beef data adjusted for average schedule price and expenditure

This report was commissioned by the Technical Leaders Group for the Healthy Rivers Wai Ora Project

The Technical Leaders Group approves the release of this report to Project Partners and the Collaborative Stakeholder Group for the Healthy Rivers Wai Ora Project.

Signed by:

Date: 2 May 2016

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Sheep and beef data adjusted for average schedule price and expenditure

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Date: 10 December 2015

This report is an updated sheep and beef farm-type data following feedback from CSG 8 workshop.

Sheep and beef data adjusted for average schedule price and expenditure

The data originally used in these case studies have been adjusted for long term price/cost averages as follows:

- Each of the case study farms, clusters I to IV, were compared with the traditional classification of Beef+Lamb NZ Economic Service farm models – Class 3, 4 and 5 Northland-Waikato-BoP.
- Averages of price/kg for different products that vary with mitigation scenarios were computed from the Beef+Lamb NZ farm models. Also, averages of expenditure per stock unit for items that vary with mitigation scenarios was also affected. The average output and input prices for the period 2005-6 to 2014-15 were considered. The 2013-14 and 2014-15 figures were provisional and forecast data respectively.¹
- The average price and expenditure cost data were then applied to schedule and expenses data for the case-study farm clusters in FARMAX models.
- The previous and current adjusted prices and expenditure are presented in Figure 1 and 2 respectively.
- The adjusted results are presented in Figure 3 to 7 followed by full FARMAX profit and loss reports in tables.

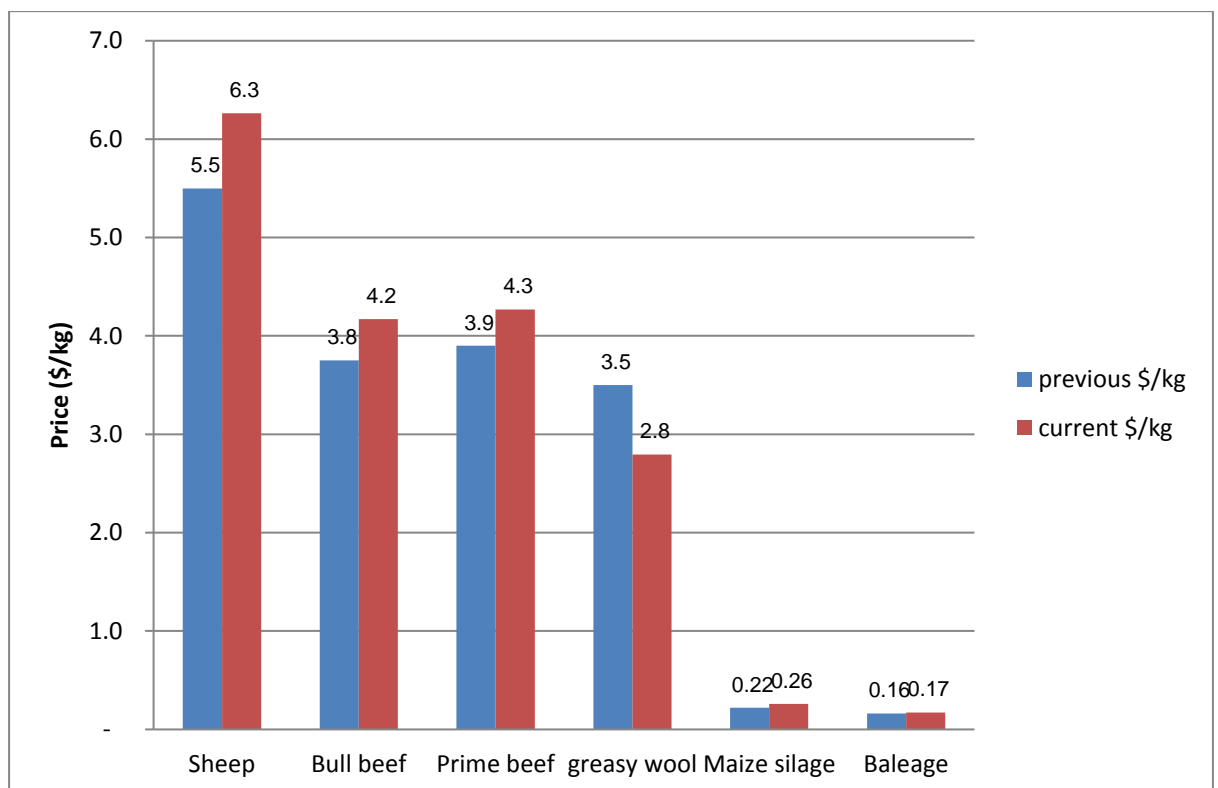
¹Beef + Lamb New Zealand Economic Service 2015 Accessed online April 2015: <http://www.beeflambnz.com/information/on-farm-data-and-industry-production/sheep-beef-farm-survey/>

Schedule price and expenditure

In the original analysis, the schedule prices and expenses for year 2011/12 to 2012/13 were used (as shown in the blue bars in figures 1 and 2). The sheep price could have been higher than is shown here if the updated price file from FARMAX were used. However, the projected figures for 2011/12 and 2012/13, as found in the FARMAX database at the time that the FARMAX modelling was done in late 2013, were used. Because the price data were kept in WRC internal computer systems, they were not updated using the FARMAX monthly monitoring service. Consequently, the projected price files used in the original analysis that did not capture the extent of the spike in sheep and beef schedule prices in 2011/12. The immediate implication is that the use of average prices and expenditure in this extension of the original assessment suggests higher financial impacts of the mitigations.

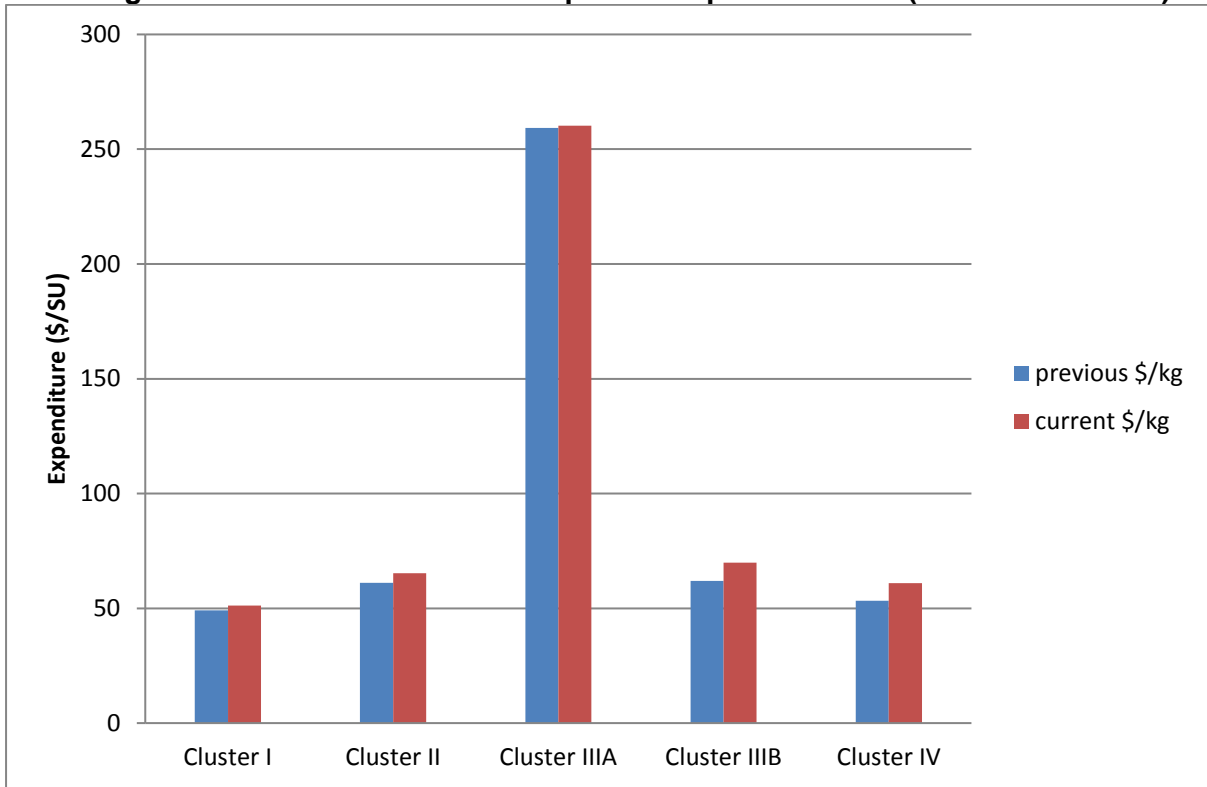
To test the sensitivity of findings to these prices, the analysis has been redone. Using the Beef+Lamb database and FARMAX weekly price monitoring database over the period 2005/6 to 2014/15 is intended to account for variation in prices and costs within the deterministic modelling framework adopted. The current (ie updated) price schedule and expenditure are presented in the red bars in Figures 1 and 2 as average schedule price (\$/kg) and average expenses (\$/SU), respectively. The prices and expenses were applied to the farm cluster models in FARMAX and the results are presented in Figures 3 to 7. The nutrient levels for each baseline and mitigation scenario are as reported in the previous analysis. The difference between the previous results and the updated results are an indication of the mix and level of enterprises being represented in each of the farm clusters and the products and costs affected by the mitigation scenarios. The full FARMAX profit and loss estimates by mitigation scenarios are presented in tables for each farm cluster.

Figure 1: Previous and current schedule price (2005/6 – 20014/15)²



² The forestry revenue is \$129/ha annuity based on SCION estimates

Figure 2: Previous and current expenditure per stock unit (2005/6 – 20014/15)



Cluster I: Small sheep & beef farms with beef finishing operation

Mitigation: Reduce stocking rate

Original analysis

As stocking rates are reduced, net profit also falls, since the rate of revenue loss is more than the rate of cost saving as stocking rate reduces. Specifically, revenues in the scenario with the largest reduction in stocking rate (25 percent) are \$245/ha lower than the baseline, while the total farm expenses only fall by \$68/ha (largely as a result of lower wages, animal health and shearing, and repairs and maintenance costs).

Updated analysis

As before, revenue losses exceed cost savings as stocking rate reduces. Specifically, revenues in the scenario with the largest reduction in stocking rate (25 percent) are \$283/ha lower than the baseline, while the total farm expenses only fall by \$61/ha (again, largely driven by lower wages, animal health and shearing, and repairs and maintenance costs).

The use of the 10-year average price and expenditure data results in marked increase in the potential financial impacts of this mitigation (Figure 3). While revenues per hectare fall by more in the updated analysis (due to higher prices), the effect on expenses is relatively small. As a result, while profit per hectare fell by \$177 in the original analysis, the fall was \$222 when using the updated prices. It is noted that, while the total fall was larger, the overall profitability of these farms was higher with the updated higher prices. The full FARMAX profit and loss estimates are presented in Tables 1 and 2.

Figure 3: FARMAX and OVERSEER results for cluster I

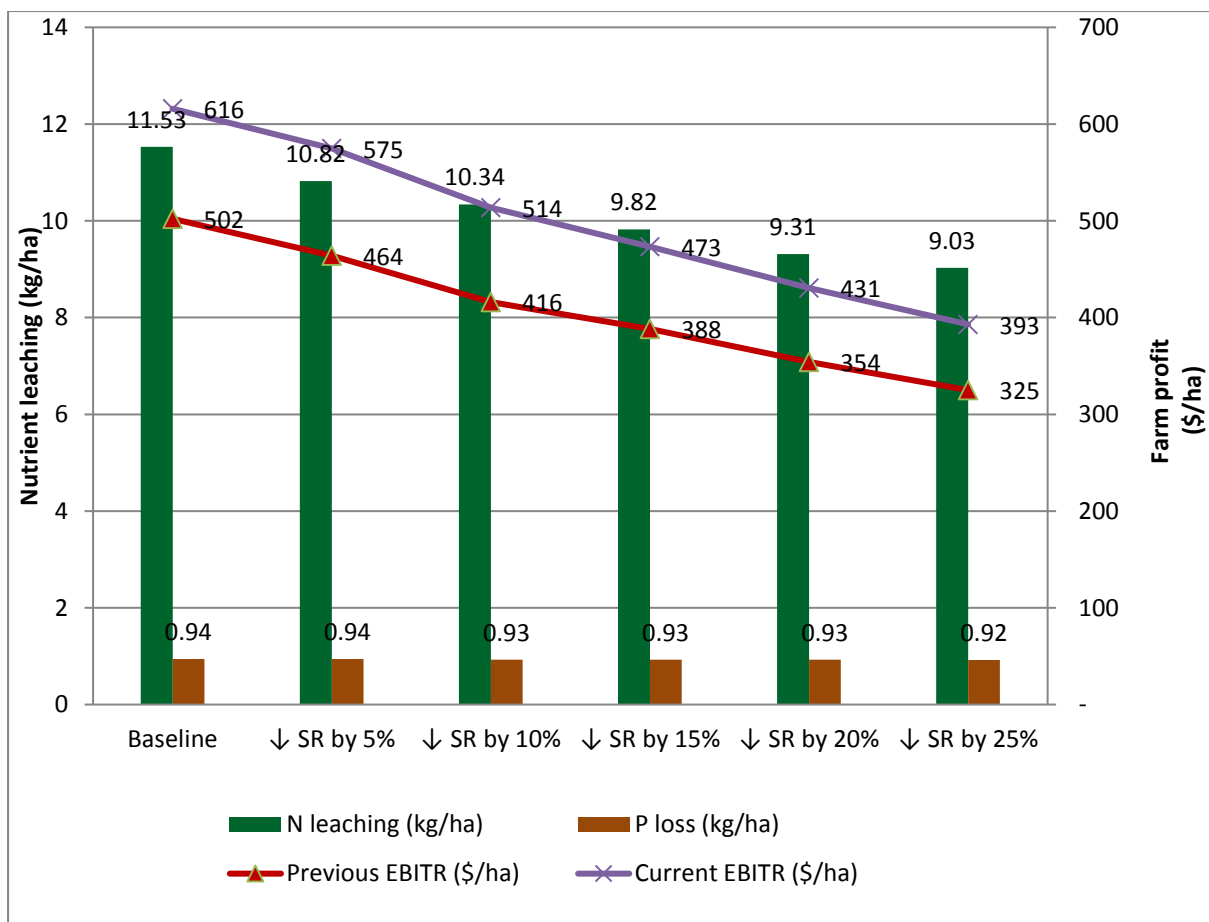


Table 1:³ Cluster I: FARMAX profit and loss estimates (updated)

FARMAX		Compare Forecast Profit and Loss						
		Jul 14 - Jun 15						
		Cluster 1 - Baseline	Cluster 1 - Scenario 1	Cluster 1 - Scenario 2	Cluster 1 - Scenario 3	Cluster 1 - Scenario 4	Cluster 1 - Scenario 5	
Revenue	Sheep	Sales - Purchases	432,012	410,548	380,069	354,644	331,578	310,320
		Wool	66,248	64,220	59,588	56,196	53,283	50,236
		Capital Value Change	-2,700	-12,852	-6,959	-297	3,069	8,420
		Total	495,560	461,915	432,697	410,543	387,930	368,976
	Beef	Sales - Purchases	185,437	184,182	165,194	155,310	144,571	133,611
		Capital Value Change	3,552	3,404	3,108	2,960	2,812	2,516
Total		188,989	187,586	168,302	158,270	147,383	136,127	
	Total Revenue	684,549	649,501	600,999	568,812	535,314	505,103	
Expenses	Wages	Wages	37,920	35,355	32,576	30,725	29,001	27,077
		Management Wage	5,586	5,208	4,798	4,526	4,272	3,988
	Stock	Animal Health	27,142	25,306	23,317	21,992	20,758	19,381
		Shearing	9,755	9,095	8,380	7,904	7,461	6,966
	Fertiliser	Fertiliser (incl N & Lime)	52,070	52,070	52,070	52,070	52,070	52,070
		Nitrogen	4,070	4,070	4,070	4,070	4,070	4,070
		Lime	2,694	2,695	2,694	2,695	2,694	2,694
	Other Farm Working	Weed & Pest Control	8,280	8,280	8,280	8,280	8,280	8,280
		Vehicle Expenses	13,999	13,999	13,999	13,999	13,999	13,999
		Fuel	13,238	13,238	13,238	13,238	13,238	13,238
		Repairs & Maintenance	39,493	36,822	33,927	32,000	30,205	28,200
		Freight & Cartage	9,834	9,169	8,448	7,968	7,521	7,022
		Electricity	5,507	5,134	4,731	4,462	4,212	3,932
	Slaughtering Charges	Administration Expenses	14,874	14,874	14,874	14,874	14,874	14,874
		Insurance	7,684	7,684	7,684	7,684	7,684	7,684
		ACC Levies	5,300	5,300	5,300	5,300	5,300	5,300
		Rates	14,462	14,462	14,462	14,462	14,462	14,462
		Total Farm Working Expense	271,907	262,760	252,848	246,249	240,101	233,238
		Depreciation	22,418	22,418	22,418	22,418	22,418	22,418
		Total Farm Expenses	294,325	285,178	275,267	268,667	262,519	255,656
	Economic Farm Surplus (EFS)	390,224	364,323	325,732	300,145	272,794	249,447	
Other Expenses	Rent/Leases	14,493	14,493	14,493	14,493	14,493	14,493	
	Interest	95,113	88,680	81,709	77,068	72,744	67,917	
	Farm Profit before Tax	280,617	261,150	229,530	208,584	185,557	167,038	
	Farm Profit per ha before Tax	443	412	362	329	293	263	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

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³ Please note that the data represents assumed average over 2005/6 – 2014/15

Table 2: Cluster I: FARMAX profit and loss estimates (previous)

FARMAX		Compare Forecast Profit and Loss						
		Jul 11 - Jun 12						
		Cluster 1 - Baseline	Cluster 1 - Scenario 1	Cluster 1 - Scenario 2	Cluster 1 - Scenario 3	Cluster 1 - Scenario 4	Cluster 1 - Scenario 5	
Revenue	Sheep	Sales - Purchases	376,144	362,235	335,041	312,563	292,167	273,544
		Wool	81,501	79,032	73,360	69,229	65,555	61,868
		Capital Value Change	-4,275	-19,701	-10,531	-357	4,621	12,776
	Total	453,370	421,566	397,870	381,434	362,342	348,188	
	Beef	Sales - Purchases	172,968	171,379	154,127	145,241	136,255	124,774
		Capital Value Change	5,232	5,014	4,578	4,360	4,142	3,706
Total		178,200	176,393	158,705	149,601	140,397	128,480	
Total Revenue	631,569	597,959	556,575	531,036	502,740	476,668		
Expenses	Wages	Wages	38,052	35,472	32,685	30,830	29,101	27,169
		Management Wage	5,605	5,225	4,815	4,541	4,287	4,002
	Stock	Animal Health	20,762	19,212	17,693	16,649	15,704	14,683
		Shearing	34,744	33,296	30,991	29,287	27,738	26,236
	Fertiliser	Retiler (incl. N & Lime)	52,070	52,070	52,070	52,070	52,070	52,070
		Nitrogen	4,070	4,070	4,070	4,070	4,070	4,070
		Lime	2,694	2,695	2,694	2,695	2,694	2,694
	Other Farm Working	Wood & Post Control	8,280	8,280	8,280	8,280	8,280	8,280
		Vehicle Expenses	13,999	13,999	13,999	13,999	13,999	13,999
		Fuel	13,238	13,238	13,238	13,238	13,238	13,238
		Repairs & Maintenance	39,631	36,944	34,041	32,109	30,308	28,297
		Freight & Cartage	9,868	9,199	8,476	7,995	7,547	7,046
		Electricity	5,526	5,152	4,747	4,477	4,226	3,946
	Standing Charges	Administration Expenses	14,874	14,874	14,874	14,874	14,874	14,874
		Insurance	7,684	7,684	7,684	7,684	7,684	7,684
		ACC Levies	5,300	5,300	5,300	5,300	5,300	5,300
		Rates	14,462	14,462	14,462	14,462	14,462	14,462
	Total Farm Working Expense	290,859	281,171	270,119	262,560	255,582	248,051	
	Depreciation	22,418	22,418	22,418	22,418	22,418	22,418	
	Total Farm Expenses	313,277	303,590	292,537	284,978	278,000	270,469	
Economic Farm Surplus (EFS)		318,292	294,370	264,038	246,058	224,739	206,199	
Other Expenses	Rent/Leases	14,493	14,493	14,493	14,493	14,493	14,493	
	Interest	59,735	59,735	59,735	59,735	59,735	59,735	
Farm Profit before Tax		244,064	220,141	189,809	171,829	150,511	131,971	
Farm Profit per ha before Tax		385	347	299	271	237	208	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

Cluster II: Traditional hill country with some bull finishing

Mitigation: Plant less productive area (steep slope area) of farm in trees

Original analysis

As steep pasture is progressively planted in trees, revenue from sheep and beef activities declines by around \$67/ha. This is partially offset by farm expenses (reduced by \$32/ha mainly due to lower fertiliser, wages and repairs and maintenance costs) and, in the long run, by additional income from on-farm forestry. This means that the financial impact per hectare of this mitigation is relatively small (around \$22/ha difference between the baseline and highest mitigation scenario).

Updated analysis

Sheep and beef revenues fall by (\$74/ha), with similar offsets of lower expenses (\$39/ha) and (long term) forestry income. It is noted that the relatively small financial impact of this mitigation is commensurate with the relatively small, financially marginal part of the farm that it applies to.

In the baseline, total revenues are around \$30/ha higher than in the original analysis, while expenses are \$27/ha higher, hence the net effect of the new data is small. This also applies to the various mitigation scenarios, and this is reflected by the closeness of the red and blue lines in Figure 4. The full FARMAX profit and loss estimates and another tables showing how forestry income are incorporated are presented in Table 3 to Table 6.

Figure 4: FARMAX and OVERSEER results for cluster II

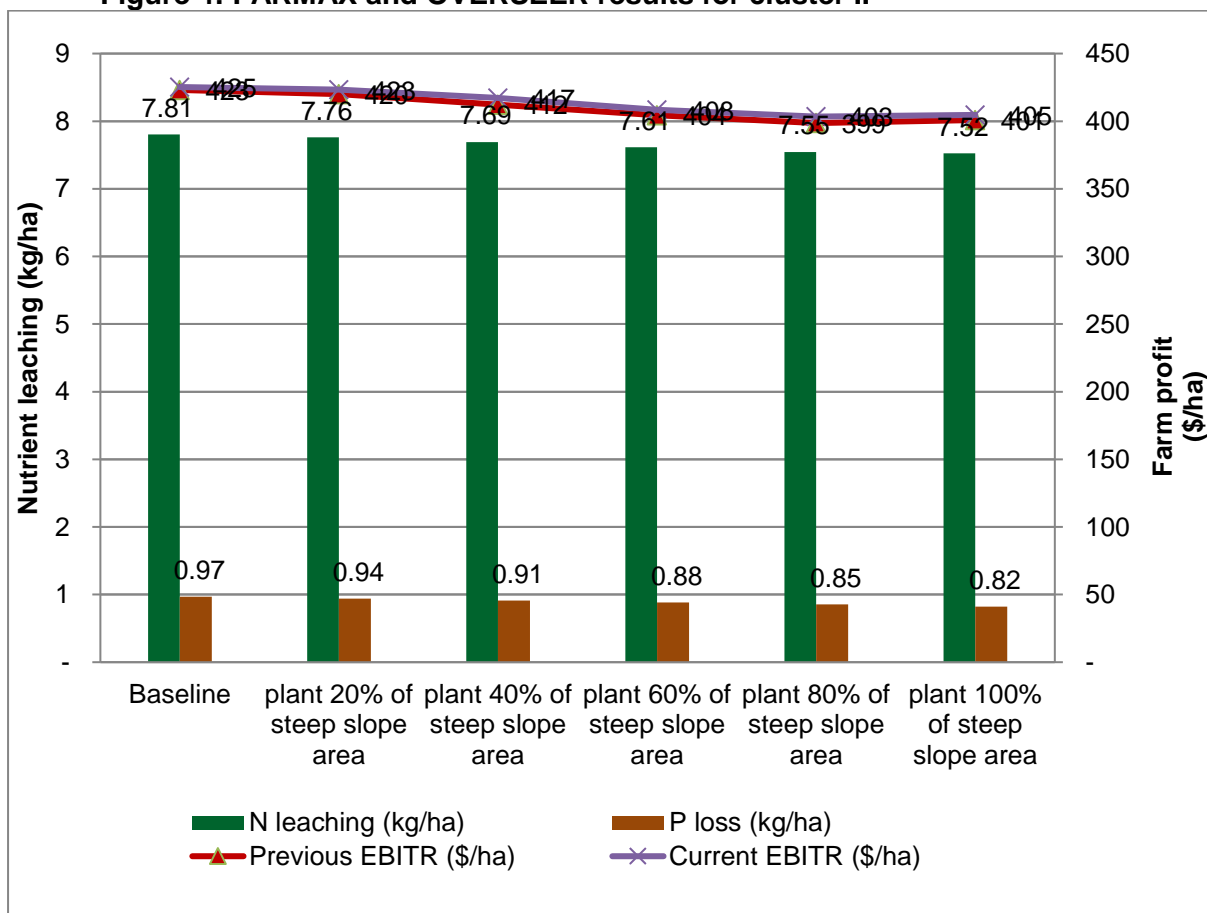


Table 3:⁴ Cluster II: FARMAX profit and loss estimates (current)

FARMAX		Compare Forecast Profit and Loss						
		Jul 14 - Jun 15						
		Cluster II - Baseline	Cluster II - Scenario 1	Cluster II - Scenario 2	Cluster II - Scenario 3	Cluster II - Scenario 4	Cluster II - Scenario 5	
Revenue	Sheep	Sales - Purchases	228,765	225,460	221,159	215,304	211,640	208,665
		Wool	44,433	43,866	43,084	42,049	41,383	40,904
		Capital Value Change	-1,758	-1,452	-1,962	-2,472	-2,574	-636
	Total	271,440	267,874	262,280	254,882	250,449	248,933	
	Beef	Sales - Purchases	40,256	39,323	38,447	38,447	37,572	36,697
Contract Grazing		95,311	94,019	92,270	90,494	88,379	86,390	
Total	135,567	133,341	130,717	128,941	125,952	123,087		
Total Revenue		407,007	401,215	392,997	383,822	376,401	372,020	
Expenses	Wages	Wages	20,543	20,229	19,857	19,413	19,047	18,750
		Management Wage	3,030	2,983	2,928	2,863	2,809	2,765
	Stock	Animal Health	11,012	10,860	10,654	10,403	10,209	10,055
		Shearing	17,145	17,027	16,858	16,633	16,493	16,404
	Fertiliser	Fertiliser (Sect. N & Lime)	41,558	40,727	39,895	39,064	38,233	37,402
		Nitrogen	723	708	694	680	665	651
		Lime	2,707	2,653	2,599	2,545	2,491	2,437
	Other Farm Working	Ward & Pest Control	6,436	6,308	6,179	6,050	5,921	5,793
		Vehicle Expenses	10,892	10,674	10,456	10,238	10,020	9,803
		Fuel	10,308	10,101	9,895	9,689	9,483	9,277
		Repairs & Maintenance	22,950	22,599	22,183	21,687	21,279	20,947
		Freight & Cartage	5,437	5,353	5,255	5,137	5,041	4,962
		Electricity	2,947	2,901	2,848	2,784	2,732	2,689
	Standing Charges	Administration Expenses	11,314	11,088	10,862	10,636	10,409	10,183
		Insurance	5,985	5,865	5,746	5,626	5,506	5,387
		ACC Levies	2,969	2,909	2,850	2,791	2,731	2,672
		Rates	11,058	10,837	10,616	10,395	10,173	9,952
Total Farm Working Expense		187,013	183,823	180,376	176,633	173,243	170,129	
Depreciation		17,784	17,428	17,073	16,717	16,361	16,006	
Total Farm Expenses		204,797	201,252	197,448	193,350	189,604	186,134	
Economic Farm Surplus (EFS)		202,211	199,964	195,549	190,472	186,797	185,886	
Other Expenses	Rent/Leases	11,224	11,000	10,775	10,551	10,326	10,102	
	Interest	43,045	42,184	41,323	40,462	39,601	38,740	
Farm Profit before Tax		147,942	146,780	143,451	139,460	136,869	137,044	
Farm Profit per ha before Tax		311	315	315	312	313	321	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

⁴ Please note that the data represents assumed average over 2005/6 – 2014/15

Table 4: Cluster II: Per ha sheep and beef and forestry estimates (current)

	area (ha)			EBITR (\$/ha)	Stocking rate	total EBIT (\$)			EBITR (\$/ha)
	pasture	forestry	SU			sheep & beef	forestry	total EBIT (\$)	
base	475.0	-	4,066.0	425.2505	8.6	201,994.0	-	201,994.0	425.3
Scenario 1	465.5	9.5	4,044.0	429.2513	8.7	199,816.5	1,225.9	201,042.4	423.2
Scenario 2	456.0	19.0	3,928.0	429.25	8.6	195,738.0	2,451.8	198,189.8	417.2
Scenario 3	446.5	28.5	3,843.0	426.2508	8.6	190,321.0	3,677.6	193,998.6	408.4
Scenario 4	437.0	38.0	3,770.0	427.2494	8.6	186,708.0	4,903.5	191,611.5	403.4
Scenario 5	427.5	47.5	3,723.0	435.2503	8.7	186,069.5	6,129.4	192,198.9	404.6

Table 5: Cluster II: FARMAX profit and loss estimates (previous)

FARMAX		Compare Forecast Profit and Loss						
		Jul 11 - Jun 12						
		Cluster II - Baseline	Cluster I - Scenario 1	Cluster I - Scenario 2	Cluster I - Scenario 3	Cluster I - Scenario 4	Cluster I - Scenario 5	
Revenue	Sheep	Sales - Purchases	223,071	219,781	215,519	209,873	206,260	203,744
		Wool	44,595	44,036	43,219	42,244	41,581	41,294
		Capital Value Change	-7,167	-6,622	-7,452	-8,094	-8,213	-4,160
	Total	260,499	257,195	251,286	244,023	239,628	240,877	
	Beef	Sales - Purchases	37,443	36,509	35,728	35,728	34,946	34,165
Contract Grazing		95,595	94,297	92,544	90,762	88,642	86,647	
Total		133,037	130,806	128,272	126,490	123,588	120,812	
Total Revenue		393,536	388,001	379,558	370,513	363,216	361,689	
Expenses	Wages	Wages	19,599	19,298	18,935	18,523	18,172	17,927
		Management Wage	2,887	2,843	2,789	2,728	2,677	2,641
	Stock	Animal Health	10,739	10,590	10,384	10,146	9,955	9,829
		Shearing	16,585	16,474	16,305	16,108	15,975	15,935
	Fertiliser	RedBor (Fact N & Lime)	36,678	36,113	35,435	34,663	34,006	35,111
		Nitrogen	723	708	694	680	665	651
		Lime	2,019	1,978	1,938	1,898	1,857	1,817
	Other Farm Working	Weed & Pest Control	6,204	6,079	5,955	5,831	5,707	5,583
		Vehicle Expenses	10,488	10,278	10,068	9,859	9,649	9,439
		Fuel	9,918	9,720	9,521	9,323	9,125	8,926
		Repairs & Maintenance	20,413	20,098	19,721	19,292	18,926	18,671
		Freight & Cartage	5,083	5,005	4,911	4,804	4,713	4,649
		Electricity	2,846	2,803	2,750	2,690	2,639	2,604
	Breeding Charges	Administration Expenses	11,143	10,921	10,698	10,475	10,252	10,029
		Insurance	5,757	5,642	5,527	5,412	5,296	5,181
		ACC Levies	3,971	3,892	3,812	3,733	3,653	3,574
		Rates	10,835	10,618	10,401	10,185	9,968	9,751
	Total Farm Working Expense		175,888	173,060	169,845	166,348	163,235	162,318
	Depreciation		16,796	16,460	16,124	15,788	15,452	15,116
	Total Farm Expenses		192,684	189,520	185,969	182,136	178,687	177,434
Economic Farm Surplus (EFS)		200,852	198,481	193,589	188,377	184,529	184,255	
Other Expenses	Rent/Leases	10,859	10,641	10,424	10,207	9,990	9,773	
	Interest	44,755	43,859	42,964	42,069	41,174	40,279	
Farm Profit before Tax		145,239	143,981	140,200	136,101	133,365	134,203	
Farm Profit per ha before Tax		306	309	307	305	305	314	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

Table 6: Cluster II: Per ha sheep and beef and forestry estimates (previous)

	area (ha)			EBITR (\$/ha)	Stocking rate	total EBIT (\$)			EBITR (\$/ha)
	pasture	forestry	SU			sheep & beef	forestry	total EBIT (\$)	
base	475.0	-	4,066.0	423.0821	8.6	200,964.0	-	200,964.0	423.1
Scenario 1	465.5	9.5	4,044.0	426.0784	8.7	198,339.5	1,225.9	199,565.4	420.1
Scenario 2	456.0	19.0	3,928.0	424.0789	8.6	193,380.0	2,451.8	195,831.8	412.3
Scenario 3	446.5	28.5	3,843.0	422.0795	8.6	188,458.5	3,677.6	192,136.1	404.5
Scenario 4	437.0	38.0	3,770.0	422.0801	8.6	184,449.0	4,903.5	189,352.5	398.6
Scenario 5	427.5	47.5	3,723.0	431.0807	8.7	184,287.0	6,129.4	190,416.4	400.9

Cluster IIIa: Hill country beef breeding/finishing with maize silage cropping for dairy support

Mitigation: At constant stocking rate, substituting cropping area for pasture

Original analysis

Comparing the baseline with the highest mitigation scenario, lower revenue from cropping leads to an overall fall in farm income of around \$590/ha, while expenses are around \$200/ha lower with the switch from maize to pasture. The net result is that, in the highest mitigation scenario, where maize cropping stops entirely, the farm surplus is \$390/ha lower than in the baseline.

Updated analysis

The decline in revenue in the updated analysis again due to lower maize silage income as the level of mitigation increases. Expenses are also lower, due to lower costs of managing pasture compared with maize silage.

The main difference between the original and updated analyses is on the revenue side, and largely driven by higher maize silage prices. As the amount of maize cropping declines, so too does the gap between the previous and updated surplus figures. Nevertheless, the implication is that the maximum cost (foregone profit) of this mitigation in the updated analysis (around \$880/ha) is much higher than it was in the original analysis (around \$390/ha). The full FARMAX profit and loss estimates are presented in Table 7 and Table 8.

Figure 5: FARMAX and OVERSEER results for cluster IIIa

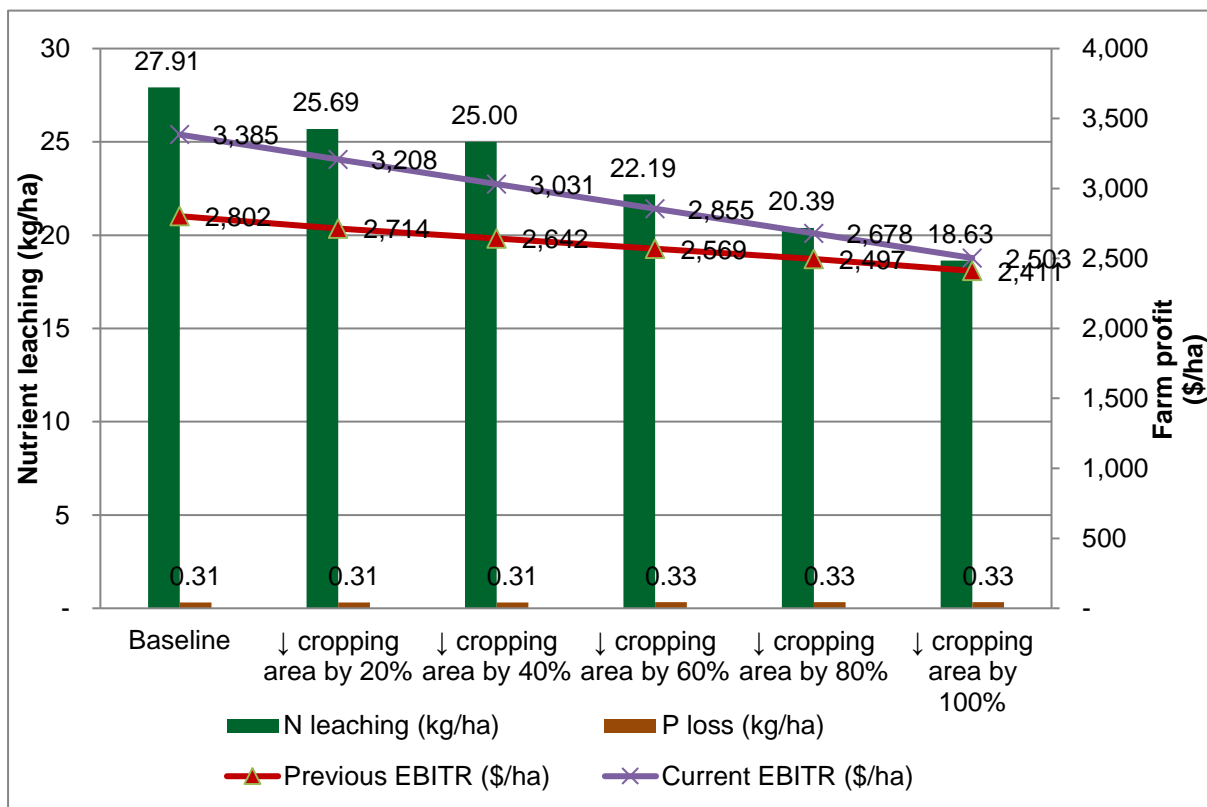


Table 7:⁵ Cluster IIIA: FARMAX profit and loss estimates (current)

FARMAX		Compare Forecast Profit and Loss						
		Jul 14 - Jun 15						
		Cluster III - Scenario	Cluster III - Scenario 1	Cluster III - Scenario 2	Cluster III - Scenario 3	Cluster III - Scenario 4	Cluster III - Scenario 5	
Revenue	Beef	Sales - Purchases	45,406	45,406	45,406	45,406	45,406	45,406
		Contract Grazing	49,965	49,965	49,965	49,965	49,965	49,965
		Capital Value Change	-4,514	-4,514	-4,514	-4,514	-4,514	-4,514
	Total	90,857	90,857	90,857	90,857	90,857	90,857	
	Crop & Feed	Surplus Feeds	209,456	196,635	183,814	170,982	158,166	145,350
Capital Value Change		0	0	0	10	5	181	
Total		209,456	196,635	183,814	170,992	158,171	145,531	
Total Revenue		300,313	287,492	274,670	261,849	249,028	236,387	
Expenses	Wages	Wages	2,285	2,285	2,285	2,285	2,285	2,285
		Management Wage	337	337	337	337	337	337
	Stock	Animal Health	1,448	1,448	1,448	1,448	1,448	1,448
		Conservation	0	13,338	26,676	40,014	53,352	66,773
	Feed/Crop/Grazing	Forage Crops	91,200	72,960	54,720	36,480	18,240	0
		Purchased Feeds	5,000	5,000	5,000	5,000	5,000	5,000
		Fertiliser (incl. N & Lime)	4,724	4,724	4,724	4,724	4,724	4,724
	Fertiliser	Nitrogen	0	1,626	3,253	4,879	6,506	8,132
		Lime	308	308	308	308	308	308
		Wood & Pest Control	732	732	732	732	732	732
	Other Farm Working	Vehicle Expenses	1,238	1,238	1,238	1,238	1,238	1,238
		Fuel	1,172	1,172	1,172	1,172	1,172	1,172
		Repairs & Maintenance	2,553	2,553	2,553	2,553	2,553	2,553
		Freight & Cartage	605	605	605	605	605	605
		Electricity	328	328	328	328	328	328
		Administration Expenses	1,286	1,286	1,286	1,286	1,286	1,286
	Standing Charges	Insurance	680	680	680	680	680	680
		ACC Levies	337	337	337	337	337	337
		Rates	1,257	1,257	1,257	1,257	1,257	1,257
		Total Farm Working Expense	115,492	112,216	108,941	105,665	102,390	99,197
Depreciation		2,022	2,022	2,022	2,022	2,022	2,022	
Total Farm Expenses		117,514	114,238	110,963	107,687	104,411	101,219	
Economic Farm Surplus (EFS)		182,799	173,253	163,708	154,162	144,617	135,169	
Other Expenses	Rent/Leases	1,276	1,276	1,276	1,276	1,276	1,276	
	Interest	4,893	4,893	4,893	4,893	4,893	4,893	
Farm Profit before Tax		176,629	167,084	157,538	147,993	138,447	128,999	
Farm Profit per ha before Tax		3,271	3,094	2,917	2,741	2,564	2,389	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

⁵ Please note that the data represents assumed average over 2005/6 – 2014/15

Table 8: Cluster IIIA: FARMAX profit and loss estimates (previous)

FARMAX 2014-2015		Compare Forecast Profit and Loss						
		Jul 12 - Jun 13						
		Cluster III - Scenario	Cluster III - Scenario 1	Cluster III - Scenario 2	Cluster III - Scenario 3	Cluster III - Scenario 4	Cluster III - Scenario 5	
Revenue	Beef	Sales - Purchases	45,270	45,270	45,270	45,270	45,270	45,270
		Contract Grazing	49,965	49,965	49,965	49,965	49,965	49,965
		Capital Value Change	-4,514	-4,514	-4,514	-4,514	-4,514	-4,514
	Total	90,721	90,721	90,721	90,721	90,721	90,721	
	Crop & Feed	Surplus Feeds	177,232	170,856	164,479	158,094	151,722	145,350
Capital Value Change		0	0	0	9	4	181	
Total		177,232	170,856	164,479	158,103	151,726	145,531	
Total Revenue		267,953	261,577	255,201	248,824	242,448	236,252	
Expenses	Wages	Wages	2,226	2,226	2,226	2,226	2,226	2,226
		Management Wage	328	328	328	328	328	328
	Stock	Animal Health	1,448	1,448	1,448	1,448	1,448	1,448
		Conservation	0	13,338	26,676	40,014	53,352	66,773
	Feed/Crop/Grazing	Forage Crops	91,200	72,960	54,720	36,480	18,240	0
		Purchased Feeds	5,000	5,000	5,000	5,000	5,000	5,000
		Fertiliser (incl. N & Lime)	4,435	6,078	6,899	7,720	8,542	10,184
	Fertiliser	Nitrogen	0	1,626	3,253	4,879	6,506	8,132
		Lime	229	229	229	229	229	229
		Wood & Pest Control	705	705	705	705	705	705
	Other Farm Working	Vehicle Expenses	1,192	1,192	1,192	1,192	1,192	1,192
		Fuel	1,128	1,128	1,128	1,128	1,128	1,128
		Repairs & Maintenance	2,319	2,319	2,319	2,319	2,319	2,319
		Freight & Cartage	577	577	577	577	577	577
		Electricity	323	323	323	323	323	323
	Standing Charges	Administration Expenses	1,267	1,267	1,267	1,267	1,267	1,267
		Insurance	654	654	654	654	654	654
		ACC Levies	451	451	451	451	451	451
		Rates	1,232	1,232	1,232	1,232	1,232	1,232
	Total Farm Working Expense		114,716	113,083	110,628	108,174	105,720	104,170
Depreciation		1,909	1,909	1,909	1,909	1,909	1,909	
Total Farm Expenses		116,625	114,992	112,538	110,084	107,629	106,079	
Economic Farm Surplus (EFS)		151,328	146,585	142,663	138,741	134,818	130,173	
Other Expenses	Rent/Leases	1,234	1,234	1,234	1,234	1,234	1,234	
	Interest	5,088	5,088	5,088	5,088	5,088	5,088	
Farm Profit before Tax		145,006	140,262	136,340	132,418	128,496	123,850	
Farm Profit per ha before Tax		2,685	2,597	2,525	2,452	2,380	2,294	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

Cluster IIIb: Hill country sheep and beef breeding with pasture-based dairy support

Mitigation: Increase sheep to cattle ratio at a constant stocking rate

Original analysis

The original analysis indicated that an increase in the sheep/cattle ratio of 70% would increase revenue from sheep of around \$730/ha compared to the baseline, outstripping losses from other revenue (about \$330/ha) and increased costs of around \$56/ha (driven by higher animal health and shearing expenses). The net effect is a ‘win-win’ scenario, whereby increasing the level of nutrient mitigation corresponds with profitability around \$340/ha than in the baseline.

Updated analysis

In the updated analysis, the switch from cattle to sheep resulted in an increase in total farm revenues of \$365/ha, while animal health and shearing costs were \$57/ha higher in the highest mitigation scenario compared with the baseline.

The effect of using the updated price data set is relatively small. The ‘win-win’ pattern remains the same, although is slightly smaller in the revised analysis. The full FARMAX profit and loss estimates are presented in Table 9 and Table 10.

Figure 6: FARMAX and OVERSEER results for cluster IIIb

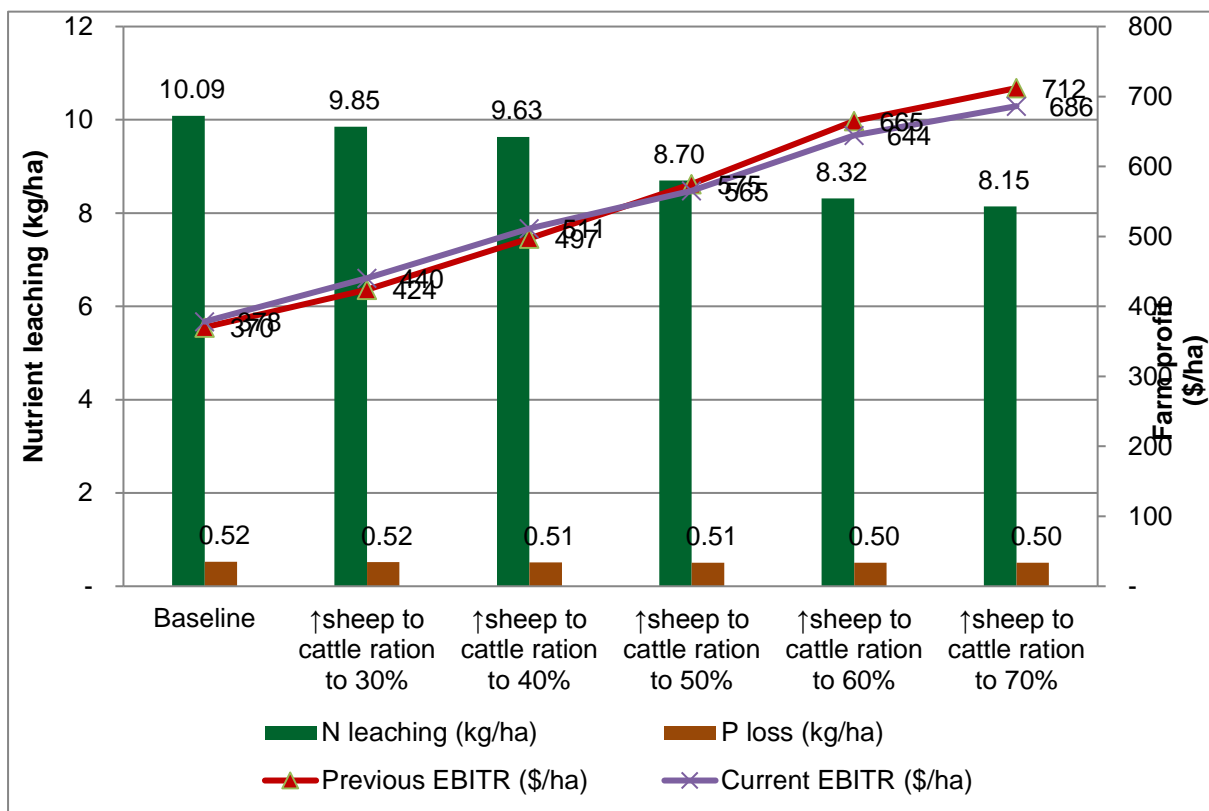


Table 9:⁶ Cluster IIIB: FARMAX profit and loss estimates (current)

FARMAX		Compare Forecast Profit and Loss						
		Jul 14 - Jun 15						
		Cluster IIIB - Scenario	Cluster IIIB - Scenario 1	Cluster IIIB - Scenario 2	Cluster IIIB - Scenario 3	Cluster IIIB - Scenario 4	Cluster IIIB - Scenario 5	
Revenue	Sheep	Sales - Purchases	76,796	113,514	156,170	191,146	233,874	266,023
		Wool	9,124	13,435	18,544	22,670	27,785	31,564
		Capital Value Change	0	-306	-204	-369	102	-471
		Total	85,920	126,643	174,510	213,447	261,761	297,116
	Beef	Sales - Purchases	145,751	126,080	105,338	90,959	70,116	52,831
		Contract Grazing	50,919	44,965	38,204	32,855	25,244	20,348
		Capital Value Change	-29,478	-22,651	-18,294	-18,858	-11,710	-9,540
		Total	167,192	148,394	125,248	104,956	83,650	63,639
	Crop & Feed	Capital Value Change	2,880	2,880	2,880	2,880	2,880	2,880
		Total	2,880	2,880	2,880	2,880	2,880	2,880
Total Revenue		255,993	277,917	302,638	321,283	348,291	363,635	
Expenses	Wages	Wages	13,878	14,045	14,192	14,135	14,157	14,261
		Management Wage	2,047	2,071	2,093	2,085	2,088	2,103
	Stock	Animal Health	6,337	6,900	7,530	7,981	8,526	9,020
		Shearing	5,257	7,732	10,668	13,069	16,011	18,201
	Feed/Crop/Grazing	Conservation	20,658	20,658	20,658	20,658	20,658	20,658
	Fertiliser	Fertiliser (Fact. N & Lime)	25,810	25,810	25,810	25,810	25,810	25,810
		Lime	1,682	1,682	1,682	1,682	1,682	1,682
	Other Farm Working	Weed & Pest Control	3,997	3,997	3,997	3,997	3,997	3,997
		Vehicle Expenses	6,764	6,764	6,764	6,764	6,764	6,764
		Fuel	6,402	6,402	6,402	6,402	6,402	6,402
		Repairs & Maintenance	15,504	15,691	15,855	15,791	15,816	15,932
		Freight & Cartage	3,673	3,717	3,756	3,741	3,747	3,774
		Electricity	1,991	2,015	2,036	2,027	2,031	2,046
	Standing Charges	Administration Expenses	7,027	7,027	7,027	7,027	7,027	7,027
		Insurance	3,717	3,717	3,717	3,717	3,717	3,717
		ACC Levies	1,844	1,844	1,844	1,844	1,844	1,844
		Rates	6,868	6,868	6,868	6,868	6,868	6,868
	Total Farm Working Expense		133,454	136,937	140,898	143,596	147,143	150,103
	Depreciation		11,045	11,045	11,045	11,045	11,045	11,045
	Total Farm Expenses		144,498	147,982	151,943	154,641	158,187	161,148
Economic Farm Surplus (EFS)		111,494	129,935	150,695	166,642	190,104	202,487	
Other Expenses	Rent/Leases	6,971	6,971	6,971	6,971	6,971	6,971	
	Interest	26,733	26,733	26,733	26,733	26,733	26,733	
Farm Profit before Tax		77,790	96,231	116,991	132,938	156,400	168,784	
Farm Profit per ha before Tax		264	326	397	451	530	572	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

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⁶ Please note that the data represents assumed average over 2005/6 – 2014/15

Table 10: Cluster IIIB: FARMAX profit and loss estimates (previous)

FARMAX		Compare Forecast Profit and Loss						
		Jul 11 - Jun 12						
		Cluster II - Scenario	Cluster II - Scenario 1	Cluster II - Scenario 2	Cluster II - Scenario 3	Cluster II - Scenario 4	Cluster II - Scenario 5	
Revenue	Sheep	Sales - Purchases	76,933	109,952	151,785	190,503	232,943	265,120
		Wool	11,265	15,994	22,100	27,892	34,149	38,829
		Capital Value Change	238	-1,698	-1,360	-670	-22	-883
	Total	88,436	124,248	172,526	217,725	267,070	303,066	
	Beef	Sales - Purchases	141,488	122,384	102,196	88,236	68,062	51,077
Contract Grazing		51,058	45,088	38,308	32,945	25,313	20,404	
Capital Value Change		-35,198	-27,147	-22,025	-22,412	-14,044	-11,392	
Total	157,349	140,325	118,479	98,770	79,331	60,089		
Crop & Feed	Capital Value Change	2,880	2,880	2,880	2,880	2,880	2,880	
	Total	2,880	2,880	2,880	2,880	2,880	2,880	
Total Revenue		248,665	267,453	293,885	319,374	349,282	366,035	
Expenses	Wages	Wages	13,561	13,597	13,696	13,793	13,804	13,909
		Management Wage	1,998	2,003	2,017	2,032	2,033	2,049
	Stock	Animal Health	6,343	6,829	7,433	7,975	8,513	9,009
		Shearing	5,273	7,477	10,346	13,048	15,970	18,170
	Feed/Crop/Grazing	Conservation	20,658	20,658	20,658	20,658	20,658	20,658
	Fertiliser	Fertiliser (Excl. N & Lime)	24,228	24,228	24,228	24,228	24,228	24,228
		Lime	1,254	1,254	1,254	1,254	1,254	1,254
	Other Farm Working	Weed & Pest Control	3,853	3,853	3,853	3,853	3,853	3,853
		Vehicle Expenses	6,514	6,514	6,514	6,514	6,514	6,514
		Fuel	6,160	6,160	6,160	6,160	6,160	6,160
		Repairs & Maintenance	14,123	14,162	14,264	14,365	14,377	14,486
		Freight & Cartage	3,517	3,526	3,552	3,577	3,580	3,607
		Electricity	1,969	1,975	1,989	2,003	2,005	2,020
	Standing Charges	Administration Expenses	6,921	6,921	6,921	6,921	6,921	6,921
		Insurance	3,575	3,575	3,575	3,575	3,575	3,575
		ACC Levies	2,466	2,466	2,466	2,466	2,466	2,466
		Rates	6,729	6,729	6,729	6,729	6,729	6,729
Total Farm Working Expense		129,141	131,926	135,654	139,150	142,639	145,607	
Depreciation		10,431	10,431	10,431	10,431	10,431	10,431	
Total Farm Expenses		139,573	142,357	146,086	149,582	153,070	156,038	
Economic Farm Surplus (EFS)		109,092	125,096	147,799	169,792	196,212	209,997	
Other Expenses	Rent/Leases	6,744	6,744	6,744	6,744	6,744	6,744	
	Interest	27,795	27,795	27,795	27,795	27,795	27,795	
Farm Profit before Tax		74,554	90,557	113,261	135,254	161,673	175,459	
Farm Profit per ha before Tax		253	307	384	458	548	595	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

Cluster IV: : Beef/bull breeding with bull and prime beef finishing

Mitigation: Substitute older/heavier cattle for younger/lighter cattle.

Original analysis

Implementing this mitigation primarily affects the revenues from beef operations. Revenues in the highest mitigation scenario are around \$230/ha lower than in the baseline, while total expenses are almost unchanged.

Updated analysis

Using the 10 year average price data set has relatively little effect on costs (they are around \$40/ha higher than in the original analysis, but the change from the baseline is still minor as the level of mitigation increases). Again, changes in revenue from the beef operation are the main driver of the cost of this mitigation. The full FARMAX profit and loss estimates are presented in Table 11 and Table 12.

Figure 7: FARMAX and OVERSEER results for cluster IV

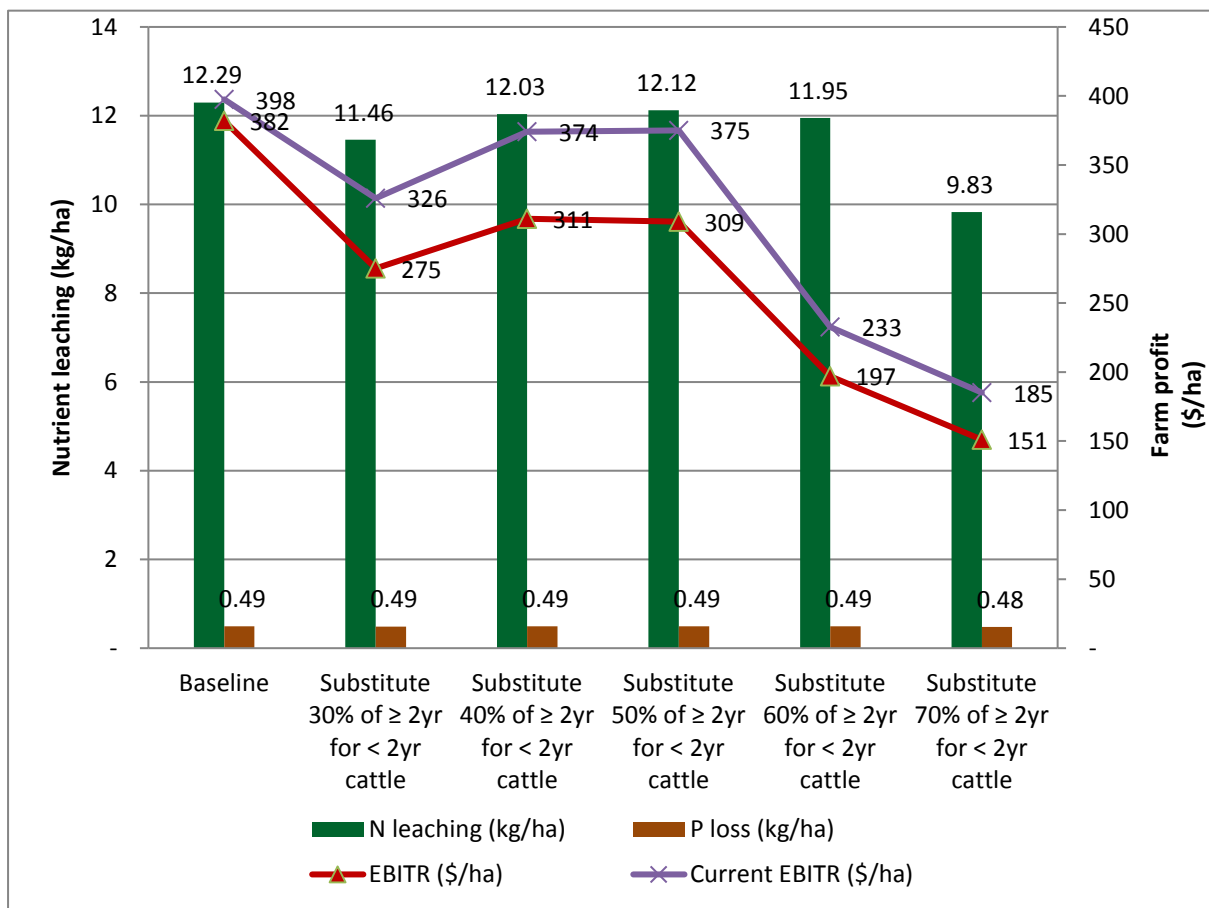


Table 11:⁷ Cluster IV: FARMAX profit and loss estimates (current)

FARMAX		Compare Forecast Profit and Loss						
		Jul 14 - Jun 15						
		Cluster IV - Baseline	Cluster IV - Scenario 1	Cluster IV - Scenario 2	Cluster IV - Scenario 3	Cluster IV - Scenario 4	Cluster IV - Scenario 5	
Revenue	Beef	Sales - Purchases	320,975	448,766	482,314	487,454	408,088	379,837
		Capital Value Change	181,114	0	0	0	0	0
		Total	502,089	448,766	482,314	487,454	408,088	379,837
	Crop & Feed	Capital Value Change	60,135	60,135	60,135	60,135	60,135	60,135
		Total	60,135	60,135	60,135	60,135	60,135	60,135
Total Revenue		562,224	508,901	542,449	547,589	468,223	439,972	
Expenses	Wages	Wages	33,151	29,976	31,408	32,596	33,870	33,762
		Management Wage	4,883	4,416	4,626	4,801	4,989	4,973
	Stock	Animal Health	23,729	21,456	22,481	23,331	24,243	24,166
		Shearing	8,529	7,712	8,080	8,386	8,713	8,686
	Feed/Crop/Grazing	Conservation	48,901	48,901	48,901	48,901	48,901	48,901
		Forage Crops	4,800	4,800	4,800	4,800	4,800	4,800
		Regrassing	3,600	3,600	3,600	3,600	3,600	3,600
	Fertiliser	Fertiliser (Fact. N & Lime)	48,210	48,210	48,210	48,210	48,210	48,210
		Nitrogen	10,112	10,112	10,112	10,112	10,112	10,112
		Lime	2,495	2,495	2,495	2,495	2,495	2,495
	Other Farm Working	Wood & Pest Control	7,666	7,666	7,666	7,666	7,666	7,666
		Vehicle Expenses	12,961	12,961	12,961	12,961	12,961	12,961
		Fuel	12,257	12,257	12,257	12,257	12,257	12,257
		Repairs & Maintenance	34,527	31,220	32,711	33,948	35,275	35,163
		Freight & Cartage	8,597	7,774	8,145	8,453	8,784	8,756
		Electricity	4,815	4,353	4,561	4,734	4,919	4,903
	Standing Charges	Administration Expenses	13,771	13,771	13,771	13,771	13,771	13,771
		Insurance	7,114	7,114	7,114	7,114	7,114	7,114
		ACC Levies	4,907	4,907	4,907	4,907	4,907	4,907
		Rates	13,389	13,389	13,389	13,389	13,389	13,389
	Total Farm Working Expense		308,414	297,090	302,195	306,433	310,976	310,594
	Depreciation		20,756	20,756	20,756	20,756	20,756	20,756
	Total Farm Expenses		329,171	317,847	322,951	327,189	331,733	331,350
Economic Farm Surplus (EFS)		233,053	191,055	219,498	220,399	136,491	108,622	
Other Expenses	Rent/Leases	13,419	13,419	13,419	13,419	13,419	13,419	
	Interest	83,154	75,189	78,780	81,760	84,955	84,686	
Farm Profit before Tax		136,481	102,446	127,299	125,221	38,116	10,517	
Farm Profit per ha before Tax		233	175	217	213	65	18	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.

⁷ Please note that the data represents assumed average over 2005/6 – 2014/15

Table 12: Cluster IV: FARMAX profit and loss estimates (previous)

FARMAX PROFITABILITY		Compare Forecast Profit and Loss						
		Jul 11 - Jun 12						
		Cluster IV - Baseline	Cluster IV - Scenario 1	Cluster IV - Scenario 2	Cluster IV - Scenario 3	Cluster IV - Scenario 4	Cluster IV - Scenario 5	
Revenue	Beef	Sales - Purchases	281,133	401,046	424,695	427,006	363,370	335,275
		Capital Value Change	189,506	0	0	0	0	0
		Total	470,639	401,046	424,695	427,006	363,370	335,275
	Crop & Feed	Capital Value Change	60,135	60,135	60,135	60,135	60,135	60,135
		Total	60,135	60,135	60,135	60,135	60,135	60,135
Total Revenue		530,774	461,181	484,830	487,141	423,505	395,410	
Expenses	Wages	Wages	33,257	30,070	31,508	32,698	33,978	33,839
		Management Wage	4,899	4,429	4,641	4,816	5,005	4,985
	Stock	Animal Health	9,187	10,519	9,500	9,747	8,948	8,265
		Conservation	48,901	48,901	48,901	48,901	48,901	48,901
	Feed/Crop/Grazing	Forage Crops	4,800	4,800	4,800	4,800	4,800	4,800
		Regrassing	3,600	3,600	3,600	3,600	3,600	3,600
		Fertiliser (incl. N & Lime)	48,210	48,210	48,210	48,210	48,210	48,210
	Fertiliser	Nitrogen	10,112	10,112	10,112	10,112	10,112	10,112
		Lime	2,495	2,495	2,495	2,495	2,495	2,495
		Ward & Pest Control	7,666	7,666	7,666	7,666	7,666	7,666
	Other Farm Working	Vehicle Expenses	12,961	12,961	12,961	12,961	12,961	12,961
		Fuel	12,257	12,257	12,257	12,257	12,257	12,257
		Repairs & Maintenance	34,637	31,318	32,815	34,055	35,388	35,243
		Freight & Cartage	8,625	7,798	8,171	8,480	8,812	8,776
		Electricity	4,830	4,367	4,576	4,749	4,935	4,914
		Administration Expenses	13,771	13,771	13,771	13,771	13,771	13,771
	Standing Charges	Insurance	7,114	7,114	7,114	7,114	7,114	7,114
		ACC Levies	4,907	4,907	4,907	4,907	4,907	4,907
		Rates	13,389	13,389	13,389	13,389	13,389	13,389
		Total Farm Working Expense	285,619	278,685	281,394	284,728	287,249	286,205
	Depreciation		20,756	20,756	20,756	20,756	20,756	20,756
	Total Farm Expenses		306,375	299,441	302,150	305,484	308,006	306,961
Economic Farm Surplus (EFS)		224,399	161,740	182,680	181,657	115,499	88,449	
Other Expenses	Rent/Leases	13,419	13,419	13,419	13,419	13,419	13,419	
	Interest	55,307	55,307	55,307	55,307	55,307	55,307	
Farm Profit before Tax		155,673	93,014	113,954	112,931	46,773	19,723	
Farm Profit per ha before Tax		265	158	194	192	80	34	

EFS is a measure of farm business profitability independent of ownership or funding, used to compare performance between farms.
EFS should include an adjustment for unpaid family labour and management. This can be added to the expense database as management wage.