

Waimakariri Farm Case Study

Executive Summary

Waimakariri farm is a dairy farming operation in the central South Island, North of the Waimakariri river, approximately 40 minutes' drive from Christchurch. In 2022 the business adopted Halter on the property in the interests of testing what Halter could deliver to enhance the welfare of people, animals and land. Relative to the 2 seasons analysed for the project pre-Halter, the 2023/24 season (second season) with Halter saw pasture eaten per effective grazed hectare increase by 7.2% or 920kgDM/ha. Production increased by 12.2% per cow. The farm saw a slight drop off in reproductive performance for the 2023/24 season, it must however be noted that the first year (transition season) had seen an increase to 78% in 6 week in calf rate (ICR) and the not in calf rate decreased to 10% before noticeable decreases in performance in the second season. Staffing levels across the operation remained at the same level but staff engagement and job satisfaction has improved markedly from the viewpoint of the sharemilkers.

Table 1: Waimakariri farm performance before and post implementation of Halter

Season	Pre-Halter: 2020/21, 2021/22	Halter: 2023/24	Percentage Change
Pasture Eaten – kgDM/ha (Grazed Hectares)	12,816	13,736	7.2%
Kilograms of Milk Solids per Cow – kgMS/cow	434	487	12.2%
Kilograms of Milk Solids per Hectare – kgMS/ha (Total Hectares)	1439	1584	10.1%
Nitrogen Fertiliser -kg N/ha (Total Hectares)	187	184	-3.0%
6 Week in Calf Rate - ICR	74%	73%	-1.0%
Not in Calf (Empty) rate	11%	13%	2.0%
Cows/FTE	196	192	-2.0%
Earnings Before Interest and Taxes (EBIT) Per Hectare	\$6427	\$7142	11.1%

Farm Background

Waimakariri farm to the North of the Waimakariri river in central Canterbury was developed around 9 years ago from ex forestry plantation land in the Eyrewell forest. The farm is flat and has a 309-hectare dairy platform which is 100% irrigated by spray irrigation on free draining Lismore shallow silt soils. The farm has an additional 22 hectares dryland which is used for calf grazing.

Operating as a System 3, the farming system leverages in-shed feeding to optimise cow potential in a low-cost pasture-based system and generate profitable production. The dairy platform is all in pasture with the only cropping undertaken being grass to grass regrassing

which for the past 5 seasons has been at a rate of 20%. All cows are wintered off the dairy platform on other dairy support blocks and are returned back to the platform in calving groups from 20th July through to the end of August for late calvers. The Kiwi cross herd have an average BW above 280 with planned start of calving (PSC) dates of 25th July for first calvers and 1st August for mixed age cows. Replacements kept are at the 26-27% level and calves go off to grazing at 100kg liveweight typically in November/December each year. The farm is presently operated by variable order sharemilkers.

Management Changes Made

Halter has been a game changer for the management and staff of Waimakariri dairy farm in enabling various efficiencies across physical KPI's to be enhanced as well as reducing people fatigue and stress through Halter's unique animal management capabilities.

GRAZING MANAGEMENT

Grazing management prior to Halter was a basic 'set and forget' two breaks per day. Feeding consistency has been improved – Halter removes the personal factor of getting break placement and area allocation set right and enables the manager to have more time monitoring cow feeding. Less time needs to be spent training staff on feed allocation physically – just need to train them how to use Halter with which they quickly become competent allocating pasture or cows to pasture available. There is greater awareness of grazing residuals now amongst the staff – using a group chat they are more agile in reacting to pasture feeding variations. The farm has 57 paddocks overall – being able to go to the top 5 paddocks and reassess them for immediate grazing decisions is a very powerful capability enabled by Halter. It is easy to set long angle breaks to add in the second trough in the paddock – this helps reduce the water demand and competition for one trough. The farm was originally setup for 800 cows but is now stocked with 1000 cows at peak, and Halter allows grazing mob sizes to be set and easily changed as required based on paddock areas.

TRANSITION AND WINTERING

Wintering has become simplified across a number of areas with Halter. Staff time and travel to shift breaks and check cows has reduced with once a day checks now common compared to twice a day travel and checks on cows – this alone saves 50 minutes driving time per day. Staff are less stressed with less time needing to be spent outdoors in sometimes challenging winter conditions doing manual tasks like break cutting and fencing. There is also a gain in winter crop utilisation without cut break lines which aren't utilised as well as grazed crop. Cow resting time can be monitored and management changes made if needed including multiple break shifts or moving cows back off grazed breaks once grazing activity drops.

For calving and the associated transition period, Halter has enabled the farm to run multiple herds over the calving period and check cow allocation, activity and rumination as needed and tailor feeding and movements to suit the herd.

ENVIRONMENTAL

Grazing heat maps are observed but have not been used yet for any management changes, but they may be combined with grid soil testing in the future to tailor key nutrient inputs to improve nutrient utilisation and reduce nutrient loss risk. Nitrogen fertiliser is already spread using Topcon N-sensor technology at variable rates and this could utilise grazing heat map information in the future. For night breaks cows have been set on breaks at sides of paddocks to reduce normal nutrient transfer patterns from the back to front of paddocks. Halter is also

used to exclude cows from paddock corners where they congregate during poor weather. Back fencing is also used strategically to minimise pugging risk.

LABOUR

The sharemilkers have found there is a reduced need to have highly skilled or experienced staff on farm with Halter – the second-in-charge does not need to be at the same level as previously as for example less oversight is required at mating. When hiring staff, they have found that they can hire more on the personality traits rather than on their specific skill set – if a particular skill area is light this can be overcome due to less pressure for initial training on some of the basics that Halter takes care of. In addition, they have been able to pay slightly less salary rates for lesser skilled people when employed. The sharemilkers have been freed up to focus on higher value tasks as less time is needed to train staff on physical feed allocation – the managers just need to train them on how to use Halter. Despite massive challenges in the 2024 spring the farm still managed to stay in the top quartile of Ngai Tahu dairy farms for measures including death rate, mastitis and somatic cell count (SCC) which the sharemilkers attribute to Halter.

REPRODUCTION

Halter is used to monitor and intervene where needed to ensure all cows have at least one cycle prior to PSM. Changes made include using PG early two cycles pre-PSM this season compared to 3 days pre-PSM last season, with a focus on using the tool to lift reproductive performance. Average 3-week submission rates have seen a lift from 84% & 89% for the two seasons prior (which had 5 weeks AI followed by bulls) and 92% & 93% for the two Halter seasons (10 weeks AI only). Not in-calf rate reduced in season one but increased in the second Halter season compared to the two seasons prior.

INTANGIBLE BENEFITS

It has been noticed that herd milking timing is able to be better synchronised with Halter to allow less cow time standing on concrete resulting in less non-productive time overall as well as positive impacts on cow hooves. Work satisfaction has also improved, with staff happier and more content with their day – they think more about farming and performance rather than just the next manual task to be done. Incidences of human error have been reduced – staff are trained up on why and how the numbers are set in Halter so they can then be more engaged in the management process and make better decisions.

Financial

Financial results are modelled using a standardised approach across all case studies. The overall change in EBIT between the 2020/21, 2022/23 seasons (pre-halter) and the 2023/24 season (with halter) showed an increase in Earnings Before Interest and Tax (EBIT) of 11%. Pre-Halter EBIT was \$6427 per hectare while post implementation of Halter saw an increase to \$7142 per hectare.

Conclusion

The introduction of Halter technology at Waimakariri farm has resulted in measurable improvements across key areas of farm management, productivity, and staff satisfaction. The adoption of Halter has seen a 7.2% increase in pasture harvested per grazed hectare, contributing to improved feed efficiency and reduced reliance on supplemental feeding. Milk production per cow increased by 12.2%, reflecting improved overall cow and pasture management and improved total feed intakes.

Additionally, the impact on labour efficiency and staff engagement has been significant, allowing farm operators to streamline tasks, reduce physical workload, and focus on higher-value activities. The use of Halter has reduced human error, simplified grazing and herd management, and enhanced staff morale, which has translated into a more engaged workforce and improved farm performance.

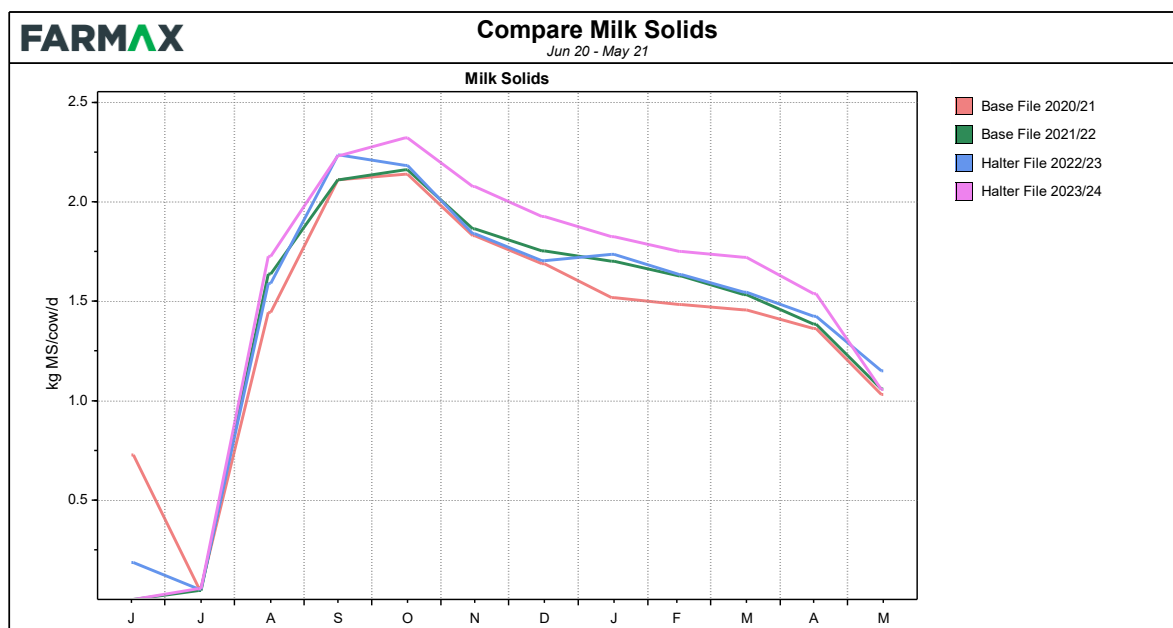
From an environmental standpoint, the ability to implement strategic grazing management through Halter provides opportunities to minimise soil damage and reduce potential nutrient loss. The success observed on Waimakariri farm is a positive story of technology adoption which will be monitored closely over the coming seasons to further validate the outcomes.

Appendix: Farmax Modelling Summaries

FARMAX Compare Physical Summary Jun 20 - May 21						
		Base File 2020/21	Base File 2021/22	Halter File 2022/23	Halter File 2023/24	
Farm	Effective Area	309	309	309	309	ha
	Stocking Rate	3.3	3.3	3.3	3.2	cows/ha
	Comparative Stocking Rate	90.2	91.2	90.1	82.5	kg Lwt/t DM eaten
	Potential Pasture Growth	13.8	14.0	15.1	14.9	t DM/ha
	Nitrogen Use per graze ha	187	187	187	187	kg N/ha
	Feed Conversion Efficiency (eaten)	10.9	10.6	10.8	10.6	kg DM eaten/kg MS
Herd	Cow Numbers (1st July)	1,059	1,050	1,037	1,024	cows
	Peak Cows Milked	1,019	1,032	1,023	1,004	cows
	Days in Milk	268	266	262	270	days
	Avg. BCS at calving	4.4	4.3	4.7	4.7	BCS
	Liveweight per graze ha	1,432	1,483	1,486	1,443	kg/ha
Production (to Factory)	Milk Solids total	433,919	455,575	452,841	489,428	kg
	Milk Solids per graze ha	1,459	1,531	1,522	1,645	kg/ha
	Milk Solids per cow	426	441	443	487	kg/cow
	Peak Milk Solids production	2.20	2.20	2.31	2.36	kg/cow/day
	Milk Solids as % of live weight	101.8	103.3	102.4	114.0	%
Feeding	Pasture Eaten per cow *	3.70	3.69	3.90	4.04	t DM/cow
	Supplements Eaten per cow *	0.63	0.68	0.50	0.72	t DM/cow
	Off-farm Grazing Eaten per cow *	0.31	0.31	0.40	0.41	t DM/cow
	Total Feed Eaten per cow *	4.63	4.69	4.80	5.18	t DM/cow
	Pasture Eaten per graze ha	12.76	12.89	13.49	13.74	t DM/ha
	Supplements Eaten per graze ha	2.52	2.76	2.09	2.83	t DM/ha
	Off-farm Grazing Eaten per graze ha	1.05	1.08	1.37	1.40	t DM/ha
	Total Feed Eaten per graze ha	16.33	16.72	16.95	17.96	t DM/ha
	Supplements and Grazing / Feed Eaten *	20.15	21.22	18.77	21.96	%
	Bought Feed / Feed Eaten *	8.44	10.19	7.20	8.83	%
Diagnostics	Cow Pasture Eaten	3,769.57	3,809.15	3,985.92	4,060.60	t DM
	Cow Total Supp Feed Eaten	637.73	705.97	513.19	725.87	t DM
	Cow Total Grazing Feed Eaten	313.77	319.91	407.92	416.65	t DM
	Cow Total Eaten	4,721.08	4,835.02	4,907.03	5,203.12	t DM
	Cow Bought Feed Eaten	398.33	492.92	353.31	459.41	t DM
	All Pasture Eaten	3,795.71	3,835.28	4,012.08	4,086.74	t DM
	All Total Supp Feed Eaten	748.33	819.86	621.89	841.09	t DM
	All Total Grazing Feed Eaten	313.77	319.91	407.92	416.65	t DM
	All Total Eaten	4,857.81	4,975.04	5,041.89	5,344.48	t DM
	All Bought Feed Eaten	398.33	492.92	353.31	459.41	t DM
Total Cow Dec Lwt		426,038	441,083	442,096	429,230	kg

(*) feed eaten by females > 20 months old / peak cows milked

Farmax Dairy 8.3.4.17



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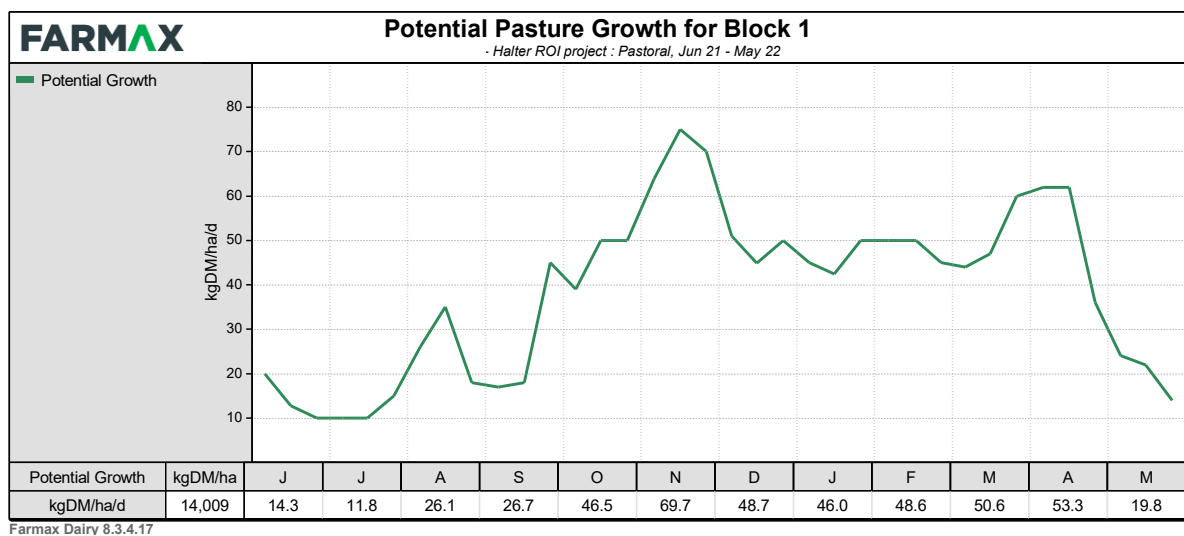
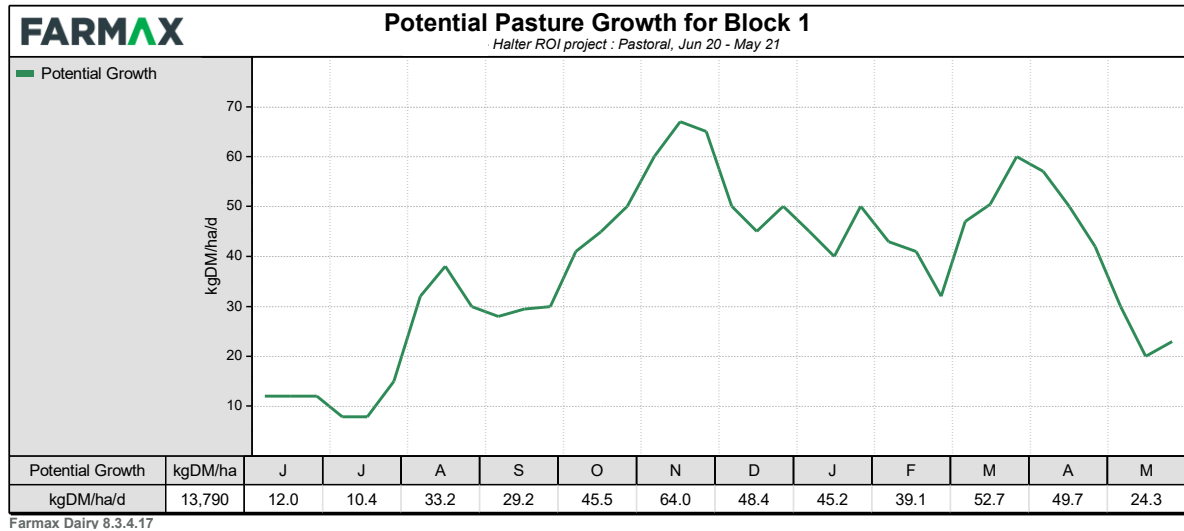
Jun 20 - May 21



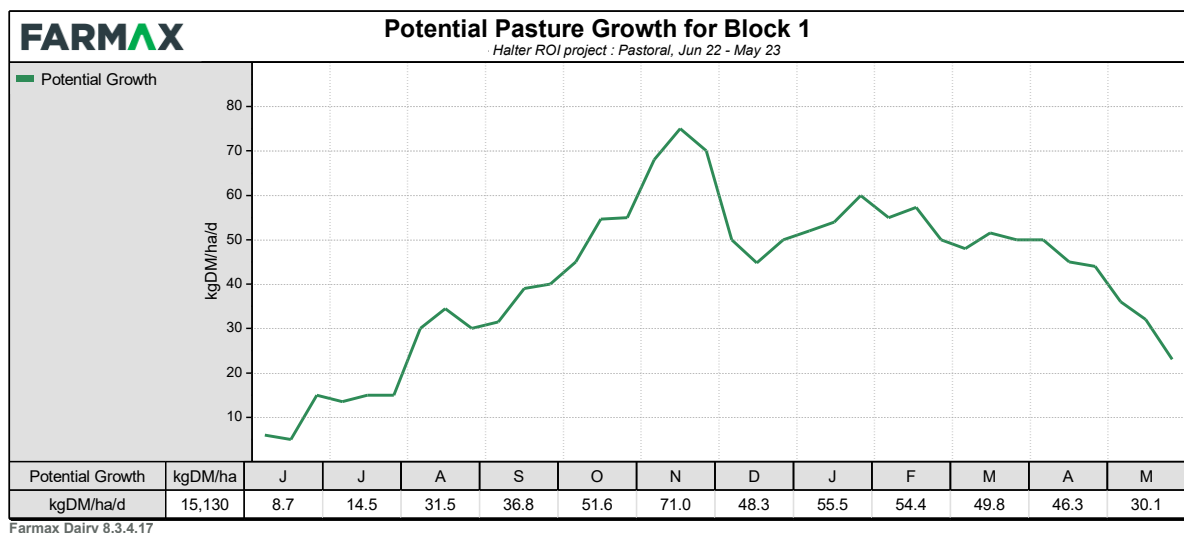
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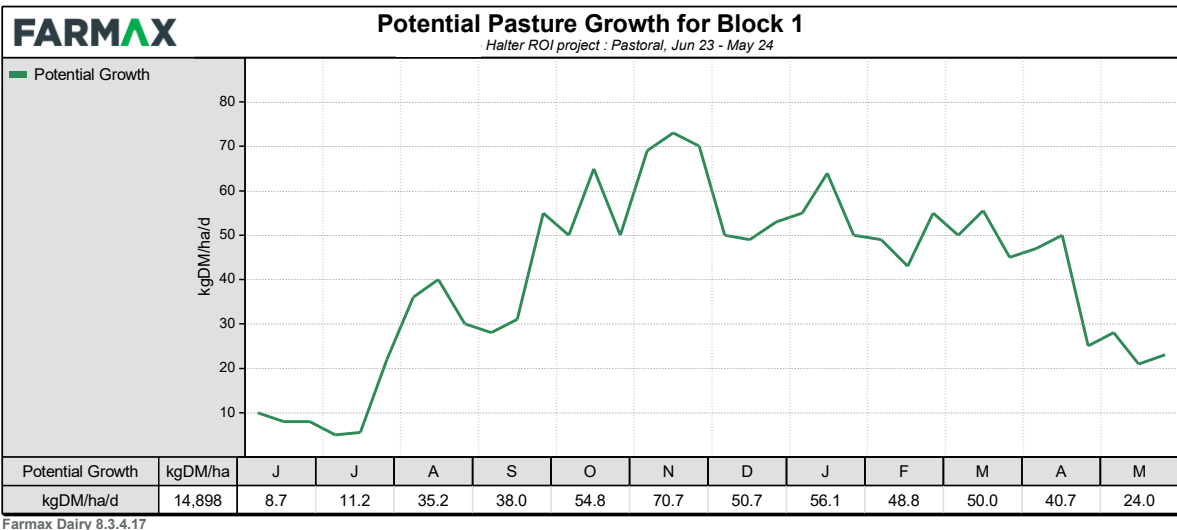


Pre-Halter - Base Growth rates



Post-Halter - Base Growth rates





FARMAX		Compare Physical Summary				
		Jun 20 - May 21				
		Base File	Base File	Halter	Halter	
		2020/21	2021/22	File 2022/23	File 2023/24	
Farm	Effective Area	309	309	309	309	ha
	Stocking Rate	3.3	3.3	3.3	3.2	cows/ha
	Comparative Stocking Rate	90.2	91.2	90.1	82.5	kg Lwt/t DM eaten
	Potential Pasture Growth	13.8	14.0	15.1	14.9	t DM/ha
	Nitrogen Use per total ha	180	180	180	180	kg N/ha
	Feed Conversion Efficiency (eaten)	10.9	10.6	10.8	10.6	kg DM eaten/kg MS
Herd	Cow Numbers (1st July)	1,059	1,050	1,037	1,024	cows
	Peak Cows Milked	1,019	1,032	1,023	1,004	cows
	Days in Milk	268	266	262	270	days
	Avg. BCS at calving	4.4	4.3	4.7	4.7	BCS
	Liveweight per total ha	1,379	1,427	1,431	1,389	kg/ha
Production (to Factory)	Milk Solids total	433,919	455,575	452,841	489,428	kg
	Milk Solids per total ha	1,404	1,474	1,466	1,584	kg/ha
	Milk Solids per cow	426	441	443	487	kg/cow
	Peak Milk Solids production	2.20	2.20	2.31	2.36	kg/cow/day
	Milk Solids as % of live weight	101.8	103.3	102.4	114.0	%
Feeding	Pasture Eaten per cow *	3.7	3.7	3.9	4.0	t DM/cow
	Supplements Eaten per cow *	0.6	0.7	0.5	0.7	t DM/cow
	Off-farm Grazing Eaten per cow *	0.3	0.3	0.4	0.4	t DM/cow
	Total Feed Eaten per cow *	4.6	4.7	4.8	5.2	t DM/cow
	Pasture Eaten per total ha	12.3	12.4	13.0	13.2	t DM/ha
	Supplements Eaten per total ha	2.4	2.7	2.0	2.7	t DM/ha
	Off-farm Grazing Eaten per total ha	1.0	1.0	1.3	1.3	t DM/ha
	Total Feed Eaten per total ha	15.7	16.1	16.3	17.3	t DM/ha
	Supplements and Grazing / Feed Eaten *	20.2	21.2	18.8	22.0	%
	Bought Feed / Feed Eaten *	8.4	10.2	7.2	8.8	%

(*) feed eaten by females > 20 months old / peak cows milked

Farmax Dairy 8.3.4.17

FARMAX		Compare Forecast Profit and Loss				
		Jun 20 - May 21				
			Base File 2020/21	Base File 2021/22	Halter File 2022/23	Halter File 2023/24
Revenue	Stock	Net Milk Sales - this season	3,889,640	4,083,771	4,059,087	4,387,231
		Net Livestock Sales	153,169	153,165	153,168	153,166
		Total	4,042,810	4,236,936	4,212,255	4,540,396
	Crop & Feed	Capital Value Change	0	0	0	0
		Total	0	0	0	0
Total Revenue			4,042,809	4,236,936	4,212,256	4,540,396
Expenses	Wages	Wages	296,100	296,100	296,100	296,100
		Management Wage	110,000	110,000	110,000	110,000
	Stock	Animal Health	145,725	149,640	148,190	142,390
		Breeding	75,375	77,400	76,650	73,650
		Farm Dairy	18,090	18,576	18,396	17,676
		Electricity	38,190	39,216	38,836	37,316
	Feed/Crop	Pasture Conserved	117,648	96,444	81,016	142,158
		Feed Crop	78,048	74,400	74,400	74,400
		Bought Feed	229,220	277,382	201,469	250,669
		Calf Feed	6,211	6,221	6,205	6,217
	Grazing	Grazing	322,235	319,429	315,000	310,993
	Other Farm Working	Fertiliser (Excl. N)	87,138	87,138	87,138	87,138
		Nitrogen	132,814	132,814	132,814	132,814
		Irrigation	148,320	148,320	148,320	148,320
		Weed & Pest Control	7,416	7,416	7,416	7,416
		Vehicle Expenses	33,990	33,990	33,990	33,990
		Fuel	33,990	33,990	33,990	33,990
		R&M Land/Buildings	123,600	123,600	123,600	123,600
		Freight & Cartage	3,090	3,090	3,090	3,090
		Other Expenses			171,864	168,672
Overheads	Administration Expenses	58,710	58,710	58,710	58,710	
	Insurance	40,170	40,170	40,170	40,170	
	ACC Levies	9,270	9,270	9,270	9,270	
	Rates	24,720	24,720	24,720	24,720	
Total Farm Working Expenses			2,140,071	2,168,036	2,241,354	2,333,469
Depreciation						
Total Farm Expenses			2,140,071	2,168,036	2,241,354	2,333,469
Economic Farm Surplus (EFS)			1,902,739	2,068,900	1,970,901	2,206,927
Farm Profit before Tax			1,902,739	2,068,900	1,970,901	2,206,927
Farm Profit per ha before Tax			6,158	6,695	6,378	7,142
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.						