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FARMING AT THE EDGE

THE PROFITABILITY OF CONVERSION TO ORGANIC FARMING SYSTEMS

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Abstract

The management accounts in Farm Account Scheme (FAS) format of two Scottish farms in Organic conversion are examined and compared to Scottish average data.

Farm 1 is a family run mixed farm with cereals, seed potatoes, cattle and sheep. Conversion has been phased with conversion ground in grass and set-aside, while cereals and potatoes have been grown conventionally until they could be grown organically. Cereal area was reduced so that livestock numbers and potato area could be maintained. The phased conversion plus organic aid payments has maintained the above average profitability although good prices for organic malting barley and seed potatoes have helped but these premiums may not be maintained.

Farm 2 is an all grass dairy farm with two 150 cow pedigree Holstein herds on a high input high output system now 9 months into conversion. The two herds were reduced and merged on to one site to form one 200 cow herd. This released capital and labour was reduced by one man saving fixed costs, while yield per cow increased with only the grass in conversion. The challenge will be to maintain yield and profitability on organic feeds.

The results to date show that with organic aid and careful planning of conversion and structural changes profitability can be maintained.

Introduction

The Kintail Land Research Foundation, a charitable educational trust, established a project to obtain information on the conversion of conventional to organic farming on two commercial farms, to identify problems and conduct trials. This includes extensive monitoring of soil conditions, nutrient status, crop and animal health. The financial performance of the farms are also monitored, the early results of which are reported in this paper.

The farms' cash book records, balance sheet information and other records from the tax accounts have been used to produce management accounts according to the procedures of the Farm Accounts Scheme (FAS) for Scotland. The Government funded FAS surveys the accounts for a large sample of farmers in Scotland to produce average accounts for a range of farm types. To allow comparison, adjustments are made that attempt to take out the effect of the farmer's personal, land, labour and capital situation. This is done by assuming that all farms are tenanted (rental value is charged for owned land), the value of farmer, spouse & family labour is charged (on the hours worked charged at manual wage rate), and all interest charges are excluded. The figures are expressed per adjusted hectare. This is the total area with rough grazing area reduced according to its stock carrying capacity. The resulting profit measure is called the Management and Investment Income (MII) which represents the return on all the tenant type capital in the business and the farmer's management input. If the farmer and spouse manual labour is excluded the figure is called the Net Farm Income (NFI).

One is a mixed livestock and arable farm in the East of Scotland the other an all grass dairy farm in the South West of Scotland.

Farm 1 East Mains of Auchterhouse

East Mains of Auchterhouse is a mixed farm of 128ha Grade 3 Land (Macaulay Land Use Capability for Agriculture Classification for Scotland) (Bibby et. al. 1991) located 10 miles inland from Dundee on the East Coast of Scotland. The principle activities are grassland for grazing and conservation for the suckler beef and finishing enterprises and the sheep enterprise; production, grading, storage and marketing of seed potatoes, and some barley and swede production. Table 1 shows the stocking and cropping for the farm.

Table 1 East Mains Crop & Stock Data

		Crop Year
	1999	2000

Crops		**Hectares**
Barley	29.6	24.2
Potatoes	31.9	28.3
Other cash crops	0	.7
Set-aside & fallow	25.9	3.3
Roots & arable fodder	3.8	3.2
Grass for hay	3.6	0
Grass for silage	16.9	35
Grass for grazing	32.2	41.3
Rough grazing	1.2	1.2
Total farm area	145.10	137.20
Total adjusted farm area	144.2	136.3
Total forage area	56.8	79.8
Proportion of rough grazing %	1	1
Livestock Average numbers		
Rearing cows	64	65
Cattle over 2 years	13	7
Cattle 1 to 2 years	37	54
Cattle under 1 year	59	50
Ewes	198	200

Other sheep	205	78
Grazing livestock units		GLU's
Cattle	99	102
Sheep	41	29
Total grazing livestock units	140	131
GLU's per forage hectare	2.5	1.6

The farm carries approximately 60 crossbred suckler cows in a closed herd. The sheep flock varies around 200 ewes with replacement stock in recent years being Texel. Store lambs are purchased in the autumn to uitilise crop aftermath and then the swedes.

onversion to organic status was staggered over three years beginning in April, May & June 1998 with 61% of the farm entering conversion, rising to 74% in 1999 and 86% in 2000 when the ground which first entered in 1998 reached organic status. The last of the farm entered conversion in 2001 and the farm will be fully converted in 2003. During conversion the principle crops were grass, set-aside and some spring barley as an entry to grass. The remaining spring barley, swedes and potatoes were grown on the conventional ground, thus avoiding reduced yields of a crop, on conversion ground, unable to receive an organic premium. It was decided to maintain livestock numbers and reduce cropping thus more grass and forage crops were required so spring barley area was reduced. Some ground in 1998 entered conversion early enough to allow the first crops of organic barley and seed potatoes to be grown in 2000. From the 2001 crop year, crops will be organic with grass only on the remaining conversion ground. For comparison the closest farm type in the Farm Accounts Scheme (FAS) was the General Cropping Farm, although East Mains has proportionally more output from cattle, sheep and potatoes and less from cereals and other crops. Table 2 shows the accounts together with the FAS averages for the respective years.

Table 2 Farm 1 Financial Results

PROFIT AND LOSS ACCOUNT

Year to 30/11

1999	FAS99/00	**2000**	FAS00/01

Farm Output from:	£/adj.Ha.(144.2)			£/adj.ha(136.3)		
Cattle				47,200		
	38,264	265	118		346	102
Sheep and wool				14,831		
	14,885	103	12		109	15
Cereals				17,588		
	18,590	129	417		129	438
Potatoes				73,550		
	107,303	744	204		540	270
Set-aside/industrial crops				977		
	6,047	42			7	
Other crops				4,314		
	-2,960	-21	201		32	161
Miscellaneous				25,486		
	3,481	24	84		187	82
Organic Aid payment	**11,794**	**82**		**14,192**	**104**	
Total						
	197,404	**1,369**	**1,036**	**198,138**	**1454**	**1,068**

Variable Costs:	98/99			99/00		
Concentrates	6,801	47	25	10,648	78	21
Roughages & keep taken	5,412	38	7	4,722	35	6
Vet and Medicine	759	5		1,569	12	

Sundry livestock expenses	4,960	34	13	8,084	59	13
Seeds	15,381	107	79	7,494	55	64
Fertiliser and lime	4,094	28	75	5,616	41	72
Crop protection	7,901	55	133	6,001	44	126
Other crop expenses	28,098	195		25,730	189	
Casual Labour				2,624	19	
Crop contract/casual labour			93			94
Total Variable Costs	**73,406**	**509**	**425**	**72,488**	**532**	**396**
Farm Gross Margin	**123,998**	**860**	**611**	**125,650**	**922**	**672**
Fixed Costs:						
Regular manual labour:						
Hired						
Family	24,908	173		25,915	190	214
Total farm labour		**173**	**217**		**190**	**214**
	24,908			**25,915**		
Fuel oil & electricity	2,895	20	42	5,177	38	54
Machinery - repairs	4,029	28	59	4,628	34	55
Machinery - depreciation	15,932	110	127	23,203	170	138
Crop contract work	25,174	175		34,100	250	
Other contract work		0			0	
Leasing charges		0	6	2,922	21	4
Total machinery &		**333**	**234**		**514**	**251**

power	**48,030**			**70,030**		
Rent/rental value	16,717	116	135	16,275	119	138
Imputed rent on improvem'ts	2,730	19	27	2,331	17	25
Rates	948	7		1,133	8	
Repairs to buildings		**65**	**21**		**51**	**20**
	9,378			**7,013**		
Total property costs		**206**	**183**		**196**	**183**
	29,773			**26,752**		
Insurances	2,211	15		3,002	22	
Miscellaneous expenses	4,235	29	53	4,259	31	56
Total Fixed Costs		**757**			**953**	**704**
	109,157		**687**	**129,958**		
Management & Inv.		**103**	**-76**	**-**	**-32**	**-32**
Income	**14,841**			**4,308**		
Add farmer & wife labour	13,330	92	77	13,456	99	82
less paid management		0			0	
Net Farm Income		**195**	**1**		**67**	**50**
	28,171			**9,148**		
Tenant's Capital	152,194	1055	**992**	200,742	1473	946
MII as % of Tenant's Capital	9.75	9.75	-	-	0	-

Year to November 1999

Other than grass and set-aside only 16ha of Spring Barley was on conversion ground during this year with all other crops grown conventionally. Output from cattle is considerably more than the average (+£147/ha) as are sheep and wool (+£91/ha) and potatoes (+£540/ha), which had a good year, while cereals are much lower (-£288/ha) although another £42/ha came from set-aside. Other crop output being primarily forage etc was negative due to between year valuation differences. Miscellaneous income, which includes contract potato grading and storage, was greater than average (+£22/ha), if organic aid was included but this alone accounted for £82/ha. Overall output was much greater (+£333/ha) even although £82/ha was from organic aid.

Reflecting the greater cattle output concentrate costs were nearly double the average, roughage and keep taken (+£30/ha) and sundry livestock were also greater. To reduce stocking density some summer grazing was taken. With the high potato output, seed costs and the combination of crop protection and other crop expenses were also greater. Overall variable costs are £174/ha greater thus the Gross Margin is £159/ha greater. This shows that the farm is technically efficient with a high input-output crop, potatoes, contributing to a good gross margin/ha.

Labour is all family and is lower than average but there is considerable crop contract work such that the combined labour and crop contract is £38/ha greater than the average which is to be expected given the high proportion of output from potatoes. Also the other power costs of fuel, repairs and depreciation are £70/ha lower than average, so that power costs in total are only £9/ha more than FAS and the total of labour and power £38/ha less than the FAS average..

Rental value is slightly lower as it is only a Grade 3 farm. The average includes farms grade 1-3. Repairs to buildings are greater (+£44/ha) so total property costs are £10 higher, insurance and miscellaneous a bit less. Overall fixed costs are £70/ha greater, but given the higher Gross Margin East Mains has a respectable Management and Investment Income (MII) of £103/ha giving a return of 9.75% on tenants capital, compared to the average loss of £76/ha. This year the farms high output enterprise has helped provide a good financial performance unaffected by the conversion period and the organic aid has compensated for the conversion area and need for more grass.

Year to November 2000

This year sees the first crop of organic seed potatoes (5ha) and spring barley (7.94 ha) produced. The remaining potatoes were grown conventionally but all other spring barley was on converting land.

Cattle output was up on last year (+£380/ha) due to greater numbers sold albeit at a lower price and greater subsidy income. The FAS average was by comparison £16 lower than the previous year. Sheep and wool output was similar to last year, but potato output was down £200/ha. Sales were similar but the closing stock was less. Yields were down as were

prices. The organic seed potatoes had to be burnt down early to prevent disease spread and had a reduced yield but sold for a premium at £300/t compared to £100/t for the conventional. By contrast the organic barley following grass yielded about the same as the conventional malting barley. It was sold for malting at a considerable premium £200/t over conventional barley £80/t thus cereal output was the same from a slightly smaller area. Set-aside having been reduced produced less income. Forage stocks etc. were up giving a positive output. Organic aid was up with more of the farm in conversion and miscellaneous income doubled due to contract potato storage and grading using the new refrigerated store which replaced one damaged earlier by fire and paid for by insurance. Overall, despite the poor potato performance, output was up £85/ha.

Concentrate costs were up £31/ha well above average but there was greater cattle output, which explains the increase in vet & medicine and sundry livestock. Seed costs fell to below average and although fertiliser and lime were up slightly they are still well below normal levels as would be expected with so much ground now in conversion or organic. Crop protection costs dropped with some of the potatoes now organic but other crop expenses are still high.

Family labour costs have risen but are still below average. Crop contract, which was already high, increased by £75/ha such that labour and crop contract combined is £145/ha greater than average. At the same time investment in machinery increased depreciation by £60/ha so total power including contract is up £200/ha. Rent etc. stays much the same and building repairs fell £10/ha. Miscellaneous and insurance increase a bit but are still within the average. But due to the rise in labour and power caused by the simultaneous rise in depreciation and contract the total fixed costs jump by £200/ha, a much greater increase than the FAS average. Even with the increase of £62/ha in Gross Margin the MII is negative albeit the same as the FAS average. The Net Farm Income which excludes the farmer and spouse manual labour is however positive.

Although the potato output showed a disappointing drop the overall farm output and gross margin increased and remained healthy relative to FAS average. The rise in fixed costs was very high and reduced the overall profitability to average levels. If the fixed costs had risen in line with FAS average the MII would have increased from the year before or had the drop in potato revenue been only £65/ha MII would have remained the same as 1999. Neither the fall in potato output nor the rise in fixed costs is attributable to the conversion per se.

Conclusion

The phased conversion has produced sound financial results with cattle income maintained using extra grazing and forage partly compensated for by reduced fertiliser costs while crops have either been conventional or moved direct to organic and then received a premium. The Organic Aid has also maintained farm output despite the reduced area of crop and set aside to allow for more grazing. The enterprise mix does leave the profit vulnerable to the fluctuating fortunes of potatoes and the fixed costs need to be kept in control to remain profitable in the future.

Farm 2 Kirkland

Kirkland Farm is an all grass and forage crop dairy farm of 180-hectare in the valley of the River Nith 14 miles north of Dumfries and about 25 miles from the coast in South West Scotland. The land is Grade 3 (Bibby et al 1991). The herd is pedigree Holstein. The physical data is shown in Table 3

Table 3 Farm 2 Physical Data

PHYSICAL DATA

		FAS	Crop Year
	2000	00/01	2001
Crops			Hectares
Triticale			
Arable silage			15.50
	14.50		
Grass-silage			77.50
	80.20		
Grass-grazing			87.70
	85.50		
Total cropping			
	180.20		180.70
Other -roads etc			1.00
	1.50		
Total farm area		101.00	
	181.70		181.70

Total forage area			
	180.20		180.70
Total adj. Ha		94.00	
	180.20		180.70
Livestock			Average numbers
Dairy cows	298	96	261
Cattle > 2 yrs	28		28
Cattle 1-2 yrs	156		176
Cattle < 1 yr	171		139
Other Cattle		153	
			Litres
Milk Quota	1,795,000		1,795,000
			GLU's
Cattle			445.06
	479.94		
GLU's/forage ha			2.46
	2.66		
Yield/cow		6,140	7,785
	7,397		

The adjusted results for the financial years to 31 March 2001 and 31 March 2002 are shown in Table 4 together with the Farm Account Scheme (FAS) average figures for dairy farms for Scotland.

The first year is before conversion so provides a base year for comparison. Unfortunately Foot and Mouth disease, which was diagnosed in the country and county in February, although not affecting the farm directly did eventually in March reach a farm 5 miles away. So movement restrictions prevented the normal sale of livestock in the last two months of the financial year. The second year is a transitional year where conversion began three months into the year in July 2001 with consequent restructuring of the business.

Table 4 Farm 2 Financial Results

PROFIT AND LOSS ACCOUNT

Year to 31 March

	2001		**FAS00/01**	**2002**	
Farm Output from:		£/adj.ha.(180.2)	£/adj.ha (94)		£/adj.ha(180.7)
Milk	408,102	2,265	1,093	408,843	2263
Cattle	45,071	250	322	61,220	339
Crops	1,204	7	86	5,328	29
Miscellaneous	13,686	76	96	15,726	87
Other income(Cara)		0		1,602	9
Total	**468,063**	**2,597**	**1,597**	**492,719**	**2726**
Variable Costs:					
Concentrates	112,522	624	330	114,904	636
Roughages & keep taken	8,516	47	54	8,763	48
Vet and Medicine	18,969	105	0	19,624	109
Sundry livestock expenses	18,156	101	110	17,747	98

Seeds	1,916	11	12	2,668	15
Fertiliser and lime	19,782	110	87	14,090	78
Crop protection	197	1	18	808	4
Other crop expenses	3,000	17	0	6,825	38
Quota leasing	6,156	34	10	5,495	30
Total Variable Costs	**189,214**	**1,050**	**621**	**190,924**	**1057**
Farm Gross Margin	**278,849**	**1,547**	**976**	**301,795**	**1670**
Fixed Costs:					
Regular manual labour:					
Hired	78,946	438	234	75,883	391
Family	8,037	45	226	8,192	45
Total farm labour	**86,983**	**483**	**460**	**84,075**	**436**
Fuel oil and electricity	12,433	69	59	11,529	64
Machinery - repairs	16,121	89	57	13,669	76
Machinery - depreciation	26,365	146	107	26,167	145
Crop contract	20,802	115	53	21,381	118
Leasing charges	295	2	1	100	1
Total machinery & power	**76,016**	**422**	**277**	**72,846**	**403**
Rent	22,988	128	113	19,992	111
Imputed rent on Ten. Imp's	3,785	21	96	4,086	23
Rates	2,456	14	0	2,643	15
Building repairs	8,267	46	30	19,230	106
Total property costs	**37,496**	**208**	**239**	**45,951**	**254**
Insurances	3,289	18		3,829	21

Miscellaneous expenses	9,251	51	82	13,673	105
Total Fixed Costs	**213,035**	**1182**	**1058**	**220,324**	**1219**
Net Profit	**72,894**	**405**	**-82**	**88,719**	**491**
Management & Inv. Income	**65,814**	**365**	**-82**	**81,471**	**451**
Add farmer & wife labour	8,037	45	226	8,192	45
less paid management	0	0	0	0	0
Net Farm Income	**73,851**	**410**	**144**	**89,663**	**496**
Tenant's Capital	368,490	2045	1430	327,092	1810
MII as % of Tenant's Capital	17.86	17.86	(0%)	24.91	24.91
GAIN ON SALE OF COWS				**135,460**	750
PROFIT INC. COWS				**224,178**	1241

Margin over concentrates

	2000/01	2001/02
	£	£
Milk sales	397351	408843
Agri-monetary comp.	10751	0
Total milk output	408102	408843
Dairy concentrates	80052	80420

Barley	867	0
Straights	5407	1335
Total conc.feed	86326	81755
OV Feed	6100	7115
CV Feed	7115	1200
Conc. Feed input	85311	87670
MOC	322791	321173
MOC/cow	1083	1231

Year to March 2001

The base year shows a sound profitable business particularly compared to the FAS average, despite the restrictions of Foot and Mouth disease. The reasons are that it is a technically efficient high input - high output system with milk sales well above average (+£1172/ha) with higher than average yield and milk quality. Cattle sales were a little below average partly due to the Foot & Mouth restrictions. With no cropping the crop output was lower being only adjustment in forage crop valuations. Overall output was still £1,000/ha higher than average.

This was achieved using higher than average variable costs (+£429/ha) particularly concentrates (+£300/ha), vet and medicine (although much of this is preventative monitoring) and sundry livestock, which includes a lot of bought in straw, pedigree costs and substantial AI costs. Fertiliser is also a bit higher (+£23/ha). The higher input/output system provides a substantially better Gross Margin (+£571/ha) even allowing for extra quota leasing costs of £24/ha. This highlights that the sound technical performance has been delivering financially. This is born out by a Margin over Concentrates (MOC) of £1,100/cow.

The farm size at roughly twice the FAS average requires proportionally more employed labour (+£200/ha) but total labour including farmer and family is only slightly greater than average (+£23/ha). Fuel is only slightly greater but machinery repairs, depreciation and crop contract are all greater than the average combined being £133/ha greater.

There is substantial investment in dairy and general plant and equipment but it would have been expected that repairs would thus be lower as would use of contracting.

However the larger farm may have less time for cheaper home repairs. Secondly a higher standard of maintenance may prolong machinery life and in the long term give lower depreciation and overall power figures.

Imputed rent, building repairs etc. are slightly lower than average, as are insurance and miscellaneous. The overall fixed costs are only £124/ha greater, despite the particularly high power costs. The increased fixed costs are more than covered by the higher than average Gross Margin, giving a good Management and Investment Income, Net Farm Income and a good rate of return on tenant capital of 17.86% at a time when the FAS average dairy was making a loss.

Year to March 2002

The accounts to March 2002 show an even more successful year financially despite some 9months of the conversion period, the ongoing Foot and Mouth epidemic and its aftermath.

The start of conversion saw some changes in the nature and intensity of input use, which must inevitably mean some changes in stocking rates. How this is achieved on each farm depends upon the original cropping/stocking pattern and dependence on purchased feeds. If there is sufficient cropping this can be reduced in order to maintain stock numbers but on a greater forage area. Purchased feeds can within limits be increased, stock numbers reduced or some combination. At Kirkland with virtually no cropping, quite a high level of concentrate input and two 150 cow dairy herds, the decision was to reduce cow numbers to 200 cows in one herd. The sale in the autumn of 130 cows released £195,000 of capital, which is shown separately. At £1,500/head average price against a valuation of £458/head there was a gain on sale of £135,460. Any reduction in stock numbers may create a capital gain. When done on a larger scale the taxation consequences need to be thoroughly investigated with professional help before such action is taken.

To accommodate the change £10,000 was spent on upgrading the remaining parlour. It is to be hoped that restructuring will bring real savings in some fixed costs, as with fewer cows output can be down. In this case one man was made redundant. Labour costs include the one off redundancy payment yet have reduced a bit, but in future years should show a saving of at least £90/ha. Such restructuring needs to be carefully planned to reduce such fixed costs as labour. Small adjustments may only save some overtime, which may damage staff morale.

Despite the sale of 130 cows in the autumn milk sales were similar to last year. Firstly Foot & Mouth restrictions prevented cow sales and overall milking numbers were up in the early months. Secondly yields were up such that production was over quota and price per litre was also up. With the movement restrictions lifted, cattle sales, excluding the cow displenishment, were up, so overall Gross Output was up £151/ha, well above the FAS average.

Variable costs were up only £28/ha. This was principally due to increased concentrates (+£33/ha) and other crop expenses (+£21/ha) related to reseeding and preparation for other forage crops. Following the start of conversion in July fertiliser costs fell by £32/ha. Gross Margin increased by £28/ha, well above FAS average. The Margin over Concentrates also increased by £148/ha helped by yield and milk price improving.

Of the fixed costs labour reduced, as discussed above, as did power with a reduction in machinery repairs. However power remains very high compared to average. With the building upgrades, mainly to the parlour building repairs jump to £106/ha and total property costs are now higher than average. Miscellaneous costs are up £25/ha plus the additional costs of redundancy of £29/ha.

Conclusion

Nine months into conversion this technically efficient farm has maintained its profitability when no organic premiums are obtainable yet physical output may be falling. The milk concentrate price ratio is also critical as ever for a dairy farm and together with higher yield compensated for the reduction in cow numbers within the year.

Overall Conclusions

The results to date highlight the need to consider the enterprise mix and the structure of the business to maintain profitability. Restructuring may release capital and/or reduce fixed costs. Phased conversion using grass and set aside as the principle conversion crops has allowed one farm to switch the principle crops from conventional directly to organic production. As conversion proceeds the organic aid payments are needed to maintain profitability as output is reduced without premiums being received.

References

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