The economics of organic cereal-livestock farming in Australia revisited

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Abstract

In 2001 a survey of five organic cereal-livestock farms was undertaken to assess the economics of organic broadacre farming in recent times. In the mid-1980s a similar study carried out in Eastern Australia found that organic farmers were doing as well as their conventionally farming counterparts. Under present conditions of input use and prices, productivity, output premiums and relative output prices, some organic farmers can be close in financial performance to conventional farmers interviewed. Those who have converted to organic management more recently seem to have a bit more of a struggle.

Key words: organic agriculture, farm management

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Organic farming revisited

In 2000, RIRDC and Agriculture Victoria funded a survey of five organic cereal-livestock farms. The aim of the survey was to assess the economics of organic broadacre farming in recent times. Any conventional farmer interested in changing to organic management would be interested in knowing the likely profitability. In the mid-1980s, a similar study was carried out in Eastern Australia that found that organic farmers were doing as well as their conventionally farming counterparts (Wynen 1990). But changes in relative yields, input and output prices, rotations and marketing conditions could well have changed the relative economic position of organic farmers, and therewith the interest of conventional farmers in contemplating conversion. The purpose of this study is to provide up-to-date data. However, a study of five farms can't provide all the answers. What it can do is to give an indication of how some organic farmers are doing. Any definitive study, however, would need to include more farms.

What aspects of farming are covered in this study? The questionnaire included a wide range of physical and financial data to ascertain the long term sustainability of the farms. Questions on all inputs used on the farm, both variable (such as seed, fertilisers, pesticides, fuel, hired labour) and fixed (family labour, land and capital improvements such as fences and buildings) were included. Yields per hectare together with rotations show the total production on the farm. Combined with prices received for the products, this provides figures for the returns to farming. The analysis takes into account imputed costs, such as the costs of family labour and depreciation of capital. No statistical inferences were drawn as the sample was too small for this to be meaningful.

Choosing the farms

For the study carried out in the mid-80s, a total of eight fully organic cereal-livestock farmers were located in south-eastern Australia. A further five farmers deemed to be close to organic were also included in the survey (see Wynen 1990). With expansions in

area farmed under organic management in the last decade (Hassal and Associates 1990 and Hassal and Associates 1995), it was expected that it would be easy to find five organic farmers in the dryland cereal-growing area of Victoria and Southern New South Wales.

For the 2001 survey, farms were selected from a list provided by the National Association for Sustainable Agriculture, Australia (NASAA) and the Biological Farmers of Australia (BFA). One of the requirements was that the farmers were to be dry-land farmers, with a main emphasis on crop rather than on livestock. The organic farms had to have been farmed organically for at least three years.

The NASAA list provides names of farmers who are willing to be included for marketing and research purposes. The BFA has a members' list. This organisation tends to be more active in Queensland and Northern New South Wales than towards the south, and therefore had less farmers on the list located in the area relevant to this study.

Most of the growth in numbers on NASAA's lists, however, seems to stem from farmers who are producing on floodplains or lakebeds. These producers, when cropping, tend to use organic management systems anyway, and may register as organic farmers when there are opportunities in the organic market. As the aim of this study was to provide information for farmers who are not organic, the floodplain farms were excluded from the survey.

Farmers identified as potentially suitable were sent a fax with details about the intent of the survey. A follow-up telephone call was then made to establish suitability of the farm, and to see if the farmer would agree to participate. The survey cannot be seen as a random sample, but more as case studies. However, as most of the included farmers were willing to provide data only on the condition that their particular farm could not be identified, figures in this report show only averages, and every effort has been made to maintain confidentiality. In a survey with few participants, such as this, presenting averages can be a problem if one or two farmers have results greatly different from the

other farmers. By influencing the average significantly, the picture presented may be different from what the underlying details would suggest. For this reason the variation between farmers is discussed, when relevant.

To remove the effects on yields of soil types and climate, organic farms were compared with conventional farms in their immediate neighbourhood. These farms were chosen on the basis of similarity to the organic farm, in physical characteristics (such as soil type, climate and inclusion of enterprises) and management skill. Names of potential inclusions were obtained from officers of the local Departments of Agriculture and from the organic farmer, after which the conventional farmers were contacted. Usually, there was limited choice. All characteristics could not usually be matched. The next section gives some details of characteristics that are not easy to quantify, but still relevant. Later sections then discuss the farm physical and financial characteristics.

Farmer characteristics

The farm results are due not only to the physical farm characteristics (such as size of farm, soil type and rainfall) and financial constraints (such as input costs and product prices) but also to the management skill of the farmers. Some of those skills are learned over time, through years of farming. But another part of being able to manage a farm is having a natural ability, just as some people are more natural football players, or cooks, than others. When trying to determine whether there is a difference between two farm management systems it is important to differentiate between results due to the system itself and those due to external factors, such as the natural management skill of farmers in the survey. Although it is very difficult, if not impossible, to estimate the skills accurately, some insight can be gained by knowledge about the years of experience in farming, and in organic farming, and about the farmers' opinion of what they think about their own management skills and those of their neighbour.

Regarding the first point, years of experience in farming, three of the participating pairs of farmers were of the same generation. One of those pairs had started to farm in the

second half of the 1940s, and two pairs in the early to mid-1970s. In two pairs there was a generation difference between the two neighbours, in one case the organic farmer being older, and in the other case being younger than the conventional farmer. On average, the organic farmers had farmed for 23 years, and the conventional farmers for 22 years. It can therefore be concluded that, if there is a difference in management system, it is not likely to be due to a difference in experience in farming in general.

The experience in farming organically was rather diverse between the five organic farmers. One had moved towards organic agriculture as early as the 1960s, with the last one converting in 1995, only just qualifying for inclusion in the survey. Two converted in the mid-1980s, and two in the late 1980s - early 1990s. The average years farmed organically was 14, with the average pulled up substantially by the one long-standing organic farmer. Three had farmed organically less than ten years, one of them only three years at the time of the survey.

With regard to the second point, natural ability to manage, each farmer was asked to rate themselves on a scale of 1 to 9 (9 being the best), and then to rate their neighbour. A summary of the farmers' opinion is shown in Table 1. In only three pairs were both farmers willing to express an opinion. In one case, both agreed that the conventional farmer was better. In both other cases the organic farmers thought that the farm management skills of both farmers were similar. In one of those cases the conventional farmer thought that he was better than the organic neighbour, and in the other case it was the other way round. In the two pairs where only one of the pair expressed an opinion, one considered the conventional farmer to be far better, and the other considered the two to have similar management skills. The organic farmers gave the conventional farmers an average of 7.1 and themselves 6.6 (see Table 1). The conventional farmers' estimates were 6.7 and 5.6, respectively.

Table 1

Comparison of farm management skills			
	Organic	Conventional	Org./Conv.
Organic	6.6	7.1	93
Conventional	5.6	6.7	84

In other words, it is likely that the management skill of the conventional farmers was certainly not worse than that of the organic farmers. If anything, and especially in one case and possibly two cases, it was likely to be better. In fact, both groups of farmers thought that the conventional farmers were, on average, better managers, though the organic farmers thought this to a less degree than the conventional farmers. That is, it can be assumed that differences in financial farm results between the two groups of farmers is not due to the organic farmers being better managers. The reverse, where differences in results are partly due to the included conventional farmers being better managers, is more likely to be the case.

Physical farm characteristics

The physical farm characteristics of the included organic farms as compared with their conventional neighbours were very similar to those in the 1985-86 survey. Results of the previous survey are included here, to give some indication of the likelihood of some characteristics of organic farming occurring. It should be stressed, however, that the figures of the two surveys are not directly comparable, as there are several differences between them, such as in time and space. The previous survey was conducted in the mid-1980s, and included farms from Queensland to South Australia. This time the survey concentrated on Victoria (Mallee-Wimmera and Central) and Southern New South Wales. The farms in the present study had an average rainfall of 425mm to 450 mm, with the exception of one pair, which was located in a 650 mm average rainfall area. The average for the lower rainfall group in 1998-99 was 445 mm, ranging from 285 mm to 505 mm. In 1999-00 rainfall was somewhat higher, with an average of 530 mm, varying

between 454 mm and 650 mm. In the higher rainfall area the rainfall in the two years was somewhat lower than average, around 575 mm in both years. The variation in climate in the previous study was greater.

Area operated and cropped

On average, the organic farms were 20 per cent smaller than the conventional farms (see Table 2[3]). As in the earlier survey, this figure was dominated by the small size of one of the organic farms, being not much larger than a quarter of the area operated by the neighbour. If this farm is removed from the calculations, the other four organic farms are only 11 per cent smaller, on average, than the conventional farms. One organic farm is larger than the conventionally managed neighbour farm.

Table 2

Some physical characteristics of organic and conventional farms

		Organic	Conv.	Organic +	Org/Conv	Org/Conv
				Number*	%	%
		1998-1999				**1985-86**
Area operated	ha	962	1208	1	80	81
Improved capital value	$/ha	866	875	1	99	97
Arable area / operated area	%	81	82	3	99	90
Cropped area / arable area	%	32	52	1	62	61
		1999-2000				
Cropped area / arable area		33	52	1	64	

***** Number of individual organic farms with greater values than their counterparts.

[3] This, and the next tables, show the figures for organic and conventional farms in the first two columns. In the third column the number of organic farms that have a higher value than their conventional neighbour is shown. This is not necessarily positive, for example if costs were higher. It is included to give an idea of the likelihood that this characteristic is truly different between the two systems. Comparing averages may be misleading. If two or three organic farms display higher values (with three or two having lower values), differences between the two systems are not nearly as clear cut than if all in the one group are higher than in the other group. The last two columns show the percentage of organic as compared with conventional farms, the next last for the relevant year, and the last column for the farms in the 1985-86 survey.

The quality of farm, as shown in 'improved capital value' per hectare operated (and expressing the quality of the land and capital improvements such as buildings and fences) was similar on both farm types. This is influenced by the percentage of the farm being arable, which was estimated by the farmers as similar in the two farm types.

There is a dramatic difference, though, in area cropped as a percentage of arable area in both years, the extent of which is masked by the fact that in one pair the organic farmer cropped over half of the arable area, while the conventional neighbour cropped just under one third of the land. All other organic farmers cropped between 22 and 35 per cent of their arable land, while their neighbours cropped between 50 and 62 per cent, basically double the percentage cropped on organic farms. This reflects the differing rotational requirements of organic management.

Inputs

Some inputs into the farming operations are shown in Tables 3 and 4. Inputs used mainly on crops and measured on a cost per hectare cropped basis are shown in Table 3. Some are more relevant than others. For example, fertilisers and pesticides (including all biocides, such as herbicides, fungicides, insecticides, etc.), and also fuel and machinery and equipment, are mainly used on crops. Table 4 shows all inputs on a per hectare operated basis, including those inputs that are more difficult to allocate to only cropping, such as labour.

As can be expected, the use of pesticides is low on organic farms, and those which are used are either compounds approved within organic standards (such as CO_2 in grain storage silos), or for which the farmer has withdrawn certification (such as a drench of sheep in case of emergency, for which that part of the flock is prohibited to be sold as organic for a specified time).

The use of nutrients per hectare cropped is more interesting. Expenditure on this input on these organic farms is between half and three quarters of that of their neighbours'. This

figure is heavily influenced by extensive use of lime (strictly speaking not a nutrient, but used for the enhancement of nutrient availability just the same) on one organic farm, also on part of the non-cropped area. Excluding that pair of farmers results in the organic farmers spending, on average, far less than half the amount per hectare cropped from what their conventionally farming neighbours spend (41 per cent in 1998-99, and 35 per cent in the next year). The figure in the earlier survey of 33 percent also shows that organic farmers, though spending less on this input than conventional farmers, do buy plant nutrients or substances that enhance soil fertility.

Table 3

Some financial characteristics of organic and conventional farms ($/ha cropped)

		Organic	Conv.	Organic +	Org/Conv	Org/Conv
				Number	%	%
		1998-1999				**1985-86**
Variable costs						
Fertilisers	$/ha	49	69	1	72	33
Pesticides	$/ha	1	33	0	3	6
Fuel	$/ha	58	35	5	165	107
Fixed costs						
Depreciation machinery	$/ha	108	108	2	100	88
		1999-2000				
Variable costs						
Fertilisers	$/ha	44	84	1	52	
Pesticides	$/ha	1	43	0	2	
Fuel	$/ha	56	36	4	157	
Fixed costs						
Depreciation machinery	$/ha	102	111	2	91	

***** Number of individual organic farms with greater values than their counterparts.

The use of fuel on organic farms relative to that on conventional farms is probably changing over the years, where organic farmers are now using around 60 per cent more than on conventional farms. In the earlier survey the amounts spent by organic farmers was similar to that on conventional farms. In this survey, every organic farmer in 1998-99

and 4 in 1999-2000 spent more on fuel than their neighbour. This may reflect a change in conventional practices since the mid 1980s where, for example, more intensive use of herbicides substituting for tilling, has increased in popularity over the years.

The depreciation of machinery and equipment per area cropped is similar on organic and conventional farms and, percentage wise, only slightly higher than in the earlier survey where depreciation on organic farms was 88 per cent of that on conventional farms. In absolute terms, two organic farmers showed higher depreciation costs on machinery and equipment per hectare cropped than the neighbour. One of the conventional neighbours, however, was about to retire and used contractors to carry out many of the cropping operations, thereby minimising his machinery requirements.

When looking at the inputs per hectare operated (see Table 4), the use of inputs on organic farms drops relative to the use on conventional farms. This is due to the fact that organic farmers crop less than conventional farmers.

The organic farmers spent around half of the costs on nutrients (around $15 as opposed to $30 per hectare) and, on average, a bit over three quarters of the cost on hired labour (around $18 and $22 respectively) of the amount conventional farmers spent. They used just a bit less fuel (between 94 and 99 per cent of conventional), incurred just over half of the depreciation costs on machinery ($26 to $45 per hectare), and have half as many costs again on family labour ($43 to $35 per hectare). The total use of labour between the two systems was very similar in this sample (around $62 and $56 per hectare), as it was in the previous survey ($43 and $35 per hectare). It is tempting to conclude that organic farmers have not moved to contract labour to the extent that conventional farmers have. They now have a much higher use of family labour per hectare. This was not the case in the previous survey. However, the sample size is so small that this displayed tendency may be due to the family situation of these particular farms. Not too many conclusions should therefore be drawn.

Table 4

Some financial characteristics of organic and conventional farms ($/ha operated)

		Organic	Conv.	Organic +	Org/Conv	Org/Conv
				Number*	%	%
		1998-1999				**1985-86**
Variable costs						
Fertilisers	$/ha	17	29	1	57	16
Pesticides	$/ha	0	17	0	2	3
Fuel	$/ha	14	15	2	94	54
Hired labour	$/ha	17	23	2	75	191
Fixed costs						
Family labour	$/ha	43	35	2	126	72
Depreciation machinery	$/ha	26	45	1	57	42
		1999-2000				
Variable costs						
Fertilisers	$/ha	14	34	1	40	
Pesticides	$/ha	0	17	0	1	
Fuel	$/ha	14	14	3	99	
Hired labour	$/ha	19	22	2	88	
Fixed costs						
Family labour	$/ha	43	35	3	126	
Depreciation machinery	$/ha	26	45	1	57	

***** Number of individual organic farms with greater values than their counterparts.

In summary, the farmers included in this survey, relative to those in the earlier survey, were closer in spending patterns per hectare cropped to their conventional neighbours for nutrients and machinery and equipment. Their fuel bill was relatively high. When looking at expenditure per hectare operated, this picture continued. Expenditure on total labour was similar on both farming types, both in the past and recent surveys.

Outputs

Output per hectare

Figures for output per hectare were collected for all crops, together with the marketing details. All farmers cropped wheat for which the yields, and output price, are shown in Table 5.

Table 5

Wheat yields and prices on organic and conventional farms

		Organic	Conv.	Organic +	Org/Conv	Org/Conv
				Number*	%	%
		1998-1999				**1985-86**
Wheat yield	t/ha	2.1	3.3	1	64	96
Wheat prices	$/tonne	200	125	5	160	130
		1999-2000				
Wheat yield	t/ha	1.6	3.2	0	50	
Wheat prices	$/tonne	191	121	4	159	

***** Number of individual organic farms with greater values than their counterparts.

The average yield figures are lower for organic than for the conventional farms (two thirds in the first year of the survey, half in the second year), as opposed to in the earlier study where yield figures were similar between the two systems (96 per cent of conventional). On only one organic farm was the yield higher than on the conventional farm in one of the years, with a considerably lower yield in the next year. Of the four other cases, those farms which had been under organic management longest reached 84 percent of the yields of their conventional neighbours in 1998-99, and 62 per cent in 1999-2000. The latest entrants' yields were, on average, only a bit over one third of that of their conventional neighbour in both years.

Although no specific questions were asked about problems on organic farms, it became clear that rye-grass is a major problem in the cropping phase. One farmer felt that he was getting on top of the problem by selecting a wheat variety which grows well in the early stages (in his particular case Wylah or Cunningham was the preferred option), and by planting early. Both measures are designed to smother weeds in the early growing stage.

Although all farms had stock (mainly sheep, with some also having beef cattle), it is somewhat difficult to compare yields. The reason is that some receive most of their income from wool (with different classes of wool which yield differently and fetch different prices on the market) and others from fat lambs. These should be seen as different enterprises where, for example, number of animals per hectare or wool clip per animal are really not comparable. No attempt has therefore been made to compare yields of those enterprises in this study.

Wheat prices show that the organic farmers received, on average, 60 per cent premium. In the 1980s study, this was considerably lower at 30 per cent. This was influenced by the fact that, at that time, not all organic farmers sold their wheat in the organic market. Three of the eight didn't receive any premium for their wheat, while only two of the eight sold all their wheat in the organic market. All of the five farmers in the present study received a premium for at least part of their crop in 1998-99, although one failed to attract a premium in the following year. For each farmer individually, the lowest price increase over and above the average price the conventional neighbour received for wheat in 1998-99 was 33 per cent, and the highest 115 per cent. For one other organic farmer the premium was in the mid 30s, while for the two others it was around 60 per cent. In 1999-2000 three farmers received between 57 and 72 per cent, and one 120 per cent. Most organic farmers delivered to several outlets. Though no specific data were collected on the marketing activities of the farmers, it seemed that organic farmers were spending more time and effort on finding marketing outlets where premiums were paid.

Some organic farmers had received premiums for stock but these, and premiums for wool, are much less prevalent than for crops.

Output per farm

A longer rotation period, in which there is less emphasis on cropping, was mentioned earlier as one of the characteristics of organic farming. This characteristic was found both in the earlier and the present study. It implies that on organic farms a lower portion of the total income is derived from cropping. Despite higher prices for at least some of the products, four of the five organic farmers received less income from their cropping enterprises relative to the total farm returns than conventional farmers. The exeption was the organic farmer with a small acreage and relatively high cropping percentage. The average for all five organic farmers in both years was just over half of their returns from cropping and stock were due to the cropping enterprises (including hay making), and for the conventional farmers the average was three quarters.

Even though less area is cropped on organic farms, the number of crops per farm was, on average, higher in 1998-99 (4.2 crops) than on conventional farms (2.8 crops). In 1999-2000 this difference was less distinct, with averages of 3.6 and 3.0 for the organic and conventional farms respectively. Rye was grown on several organic farms, but also safflower, flax and mustard were amongst the crops grown on organic farms.

Financial returns

The financial data are presented in Table 6 in two parts. The first part is the cash costs and returns, important for the cash flow. These cash figures are, of course, of great importance on a farm, but in the long run it is the returns net of all costs, including family labour and depreciation, which is the most important figure. This figure is shown under the heading 'adjusted returns to capital and management'. The figures are adjusted for interest and rent paid, in order to be able to compare the production capacity of the farms, irrespective of whether there is a debt on the farm. These figures are shown as $ per hectare operated and as a percentage of capital invested. This figure is the net profit of the farm. If it is zero it means that, although all costs including family labour have been paid,

the management skills of the farmer have not been rewarded. Similarly, there is no return to the investment in the farm, which would have been received if the farm had been sold and the money invested differently.

Table 6

Some financial measurements of organic and conventional farms

		Organic	Conv.	Organic +	Org/Conv	Org/Conv
				Number*	%	%
		1998-1999				**1985-86**
Total cash costs	$/ha oper.	87	146	1	59	59
Total cash receipts	$/ha oper.	172	231	1	74	69
Total farm cash Operating surplus	$/ha oper.	85	85	2	99	78
Adjusted returns to cap. and management						
- per ha operated	$/ha oper.	11.78	8.45	3	128	112
- per $ invested	%	0.82	1.43	3	51	156
		1999-2000				
Total cash costs	$/ha oper.	93	146	1	63	
Total cash receipts	$/ha oper.	139	259	0	54	
Total farm cash Operating surplus	$/ha oper.	46	113	0	41	
Adjusted returns to cap. and management						
- per ha operated	$/ha oper.	-15.80	39.70	0		
- per $ invested	%	-1.41	3.94	0		

***** Number of individual organic farms with greater values than their counterparts.

The cash figures for 1998-99 look rather similar to those of the 1980s study, though the data for 1999-2000 look substantially worse for the organic farmers. Cash costs on organic farms in both years of this survey were around 60 per cent of those on conventional farms as in the earlier study. Cash receipts were close to three quarters in 1998-99, but only half of the conventional farmers' receipts in the following year. The resulting farm cash operating surplus (which is the receipts minus the costs) were similar to those of the conventional neighbours' in 1998-99, but only 41 per cent in the following

year. In 1985-86 the difference between the two systems was somewhere between the two years included in the present study.

The returns to capital and management in 1998-99 were $11.78 per hectare on organic farms, or 0.82 per cent of the capital invested. On conventional farms the corresponding figures were $8.45 per hectare operated and 1.43 per cent of capital invested. The lower average for conventional farms in returns per hectare with higher averages for per invested capital can occur when capital values per operated hectare differs between regions.

In other words, in 1998-99 the returns to capital and management on the organic farms included in the survey were similar between the two systems, depending on the measurement used. This result is not that different from that obtained in the earlier study, where both measures were found to be somewhat higher on the organic farms.

When looking at the figures in more detail, it is interesting to note that only the two farmers who converted to organic agriculture last have negative returns, although one of the conventional neighbours had a lower return than the organic farmer. The other three had positive returns, two of which were higher than their neighbour's. It is therefore legitimate to wonder whether the relatively low average returns are due to aspects of the conversion process, such as the biological processes on the farm, or knowledge about organic management.

This measure can also be used as a good example of the limits of generalising from a sample of only five farms. When discussing the management skills of the farmers, mention was made of the likely lesser average management skills of the organic farmers. In particular, one pair of farmers was mentioned where both farmers agreed that the conventional farmer was much better. If this pair of farmers was to be removed from the survey, the averages would be considerably different. In that case the figures for the organic farmers would show returns per hectare operated of $19.39, and returns to capital

of 1.59 per cent. Corresponding figures for the conventional farms would be -$6.53 and -0.15 per cent.

In 1999-2000 the situation looks much more bleak for the organic farmers and much more positive for the conventional farmers, making the difference between the two systems quite pronounced. The returns to capital and management were well below zero for the organic farmers (-$15.80 per hectare operated and -1.41 per cent for the invested capital), and well above zero for the conventional farmers ($39.70 and 3.94 per cent, respectively). None of the organic farmers had higher returns than the conventional neighbour, as opposed to the previous year where three had better results. Eliminating the one pair of farmers with stated differences in management skills does not reverse the situation, and would still leave a difference of just under $50 per hectare operated between the two systems, and over 4 percentage points of returns to capital invested.

It is not quite clear why the relative results were so different for the different systems in the two years. For the organic farmers in 1999-00 cash costs per hectare rose 7 per cent but receipts fell 20 per cent on the previous year. Looking at the individual farms it is apparent that events such as not securing a premium for the crop, or not cutting hay in a particular year have large influences on the returns and, due to the low number of farmers in the sample, also on the averages. But other events must also have influenced the final outcome. Low relative yields for all organic farms in 1999-2000 is one of the explaining factors. The main lesson to be drawn from this is, perhaps, that several different aspects need to be attended to for organic farming to be profitable, both on the production (yield, rotations) and marketing side.

Two other issues are of importance in connection with long-term farm profitability. The first is the premium prices received by organic farmers. The returns to farming on the organic farms are heavily influenced by the premiums available. It is difficult to predict the future of these premiums. Although premiums are expected to fall in the long term, there is little evidence of this yet.

The other issue is the relative prices of crop and livestock received by farmers. In the survey years, crop prices as compared with livestock prices were high. This means that, in a system where livestock is more important for the rotation system, general revenue will drop, as it would have done on organic farms. In times when prices of livestock and their products increase relative to crop prices, these farms will then do better. This is what can be expected on organic farms in the future.

Summary and conclusions

Notwithstanding the problems of drawing conclusions from a small sample, some tentative conclusions can be drawn from the current survey.

First, organic farmers still exist. Many of these farmers appear to be making a living from organic farming (as opposed to off-farm income). However, it was more difficult than anticipated to find suitable farmers for the survey. The fact that organic farms are not obviously doing better than conventional farming would, more than likely, be an important factor. It is also noteworthy that farm business entities are becoming much more complex, with sharefarming, both off and on-farm, and contracting of services becoming more prominent.

Second, counter to expectations, better knowledge of organic methods in the community does not appear to have led to an increase in yields relative to conventional farms. Relative yields per hectare are estimated to be lower in the more recent survey. This could, of course, be due to a stronger growth in wheat yields on conventional than organic farms over the last decade, but this has not been verified in this study. What is noticeable is that those who have farmed organically longest also get the highest relative yields.

Third, premium prices are higher than previously, at least for wheat. This is also counter-intuitive, as one expects lower prices with increased productivity and supply. It may reflect improved marketing as well as increases in demand for organic products for the time being.

Fourth, although returns from the two systems are estimated to be similar in the first year of the present survey, organic farmers in the second year of the survey do not compare favourably in terms of returns to capital and management. It is clear that crop premiums for organic produce played an important role in the returns on organic farms. Other important factors are relative yields and rotational requirements.

What do these results imply for the future of organic farming? On the positive side, there exist farms still operating organically after many years, and there are substantial premiums to be had. Livestock prices have risen since the survey years, favouring organic farmers with much livestock in their rotations. The depreciation of machinery and equipment on organic farms is also substantially lower in the recent study, as it was in the 1980s study.

However, challenges remain for organic farming. The increase in the number of organic farms in recent years has been disappointing. Conventional farmers are not seeing organic farms as good business models and attempting to emulate them. Survey results presented here indicate why this might be. Yields were found to be substantially less than on conventional farms, especially on those farms more recently converted. And the combination of inputs and outputs on the two farm types are such that returns to organic farming were shown to be comparable with conventional farms only in one of the two years surveyed. These results are not easy to interpret for any conventional farmer who is interested in converting, and wants to be convinced about the economic viability of organic farming. The totally different results between the two years illustrate the need to analyse the organic farm, and the conventional neighbour, for a full rotation and under a range of climatic conditions as they occur over the years. Inclusion of more farmers in the survey is paramount as to minimise the impact of fluctuations on any one farm. An analysis of ways of handling risk might also be instructive. It is assumed organic farmers are less at risk because their input costs are lower and because the higher organic matter in the soil helps them in dry years.

In summary, under present conditions of input use and prices, productivity, output premiums and unfavourable relative output prices, some farmers who have implemented organic management systems can be close in financial performance to conventional farmers interviewed in this survey. Those who have converted to organic management more recently seem to have a bit more of a struggle, at least in one of the two years. If this is the case, the implications of this research for the industry is that much of the attention of research and extension in organic agriculture should be directed towards the early phase of organic management. Another implication is that, if the aim of research into organic agriculture is to provide good information to conventional farmers about the economic possibilities of organic farming, data will need to be available over a longer period (say, the duration of a full rotation), and collected over a substantial number of farms.

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