

The organic industry has struggled in Australia. By contrast, organic production and sales in Europe have taken off, especially since the mid 1990s. A recent study of Danish agriculture provides some useful insights into the necessary conditions needed in any market if the potentially profitable and environmentally-friendly industry is to prosper. In Denmark returns from agriculture are estimated not to decrease when up to 20 per cent of farmers are changing towards organic management methods. This result is similar to that in a study on Australian cereal-livestock farming.

THE GREENING OF EUROPE

In some countries organic agriculture has developed at an enormous pace. Before the 1990s there were few, if any, countries where more than one per cent of the farmers practised organic methods. Yet, by 1997 Austria led the way with approximately 10 per cent of farmers being organic, and many more countries exceeding the one per cent mark. For example, in Denmark and Germany, between two and three per cent of farmers followed organic practices in that year, in Italy and Finland between three and four per cent, and in Sweden and Switzerland between six and seven per cent. In the UK, the figure jumped from 0.4 per cent in 1997 to 1.3 per cent in 1998.

Many factors may contribute to this development, not least, pressure from consumers which encourages retailers to sell the product and guarantees producers a premium. Environmental groups are also important in the debate, as they stress that organic agriculture is a sensible way to reduce some environmental problems related to farming.

Another important factor is the support organic agriculture receives from the government. These exist not only in the form of farm subsidies, but also through research and development fund allocation to this farming method. For example, in Denmark, with a population of five million people, \$10 million was allocated in this area between 1996 and 1999, with possibilities for increased funding where needed.

The equivalent figure in Australia was less than \$250,000 for 1998. What exactly the link is between supportive policies and the development of organic agriculture in the European Union is presently researched with a \$2 million funding grant. This research is also meant to

Organic agriculture: A growth industry?

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develop policy recommendation to further encourage organic agriculture, as the European Union now sees this as one means to reduce environmental problems.

Danish agriculture

The Danish Institute for Agricultural and Fisheries Economics (DIAFE), the Danish equivalent of Australia's ABARE, undertook an analysis using their farm level data in the three main agricultural sectors in Denmark, and assessed the effect of up to 80 per cent of all farmers changing to organic agricultural methods.

A similar study was carried out with funding from RIRDC in Australia to assess the effect on the cereal-livestock sector in Australia, where a hypothetical 30 per cent change to organic management was examined.

The main sector in Denmark is dairy, comprising about half of all farms in Denmark. Pig farms constitute about one third of all farms, and crop-only farms about 20 per cent. Farmers in this last sector crop on average just over 100 hectares, while the size of dairy farms is an average of 56 hectares, and of pig farms 65 hectares.

Although these two last sectors are classified according to the livestock enterprise with which they deal, both also have a large part of the farm in crops.

Most of the organic farms in Denmark can be found in the dairy-crop sector, so

DIAFE's figures on organic farms are mainly on those farms. For that reason, only the dairy sector is discussed here, with the emphasis on its cropping practices.

General organic methods

In essence, in order to cope with soil fertility and pest problems organic farmers change, amongst other things, their rotation. Often, more pasture-based activities are included than on the conventional farm. Other measures can include a change in planting date, crop varieties, livestock breeds, number of livestock, farm lay-out and so on.

Organic farmers often experience lower yields, especially in intensive agriculture. But they also tend to have lower input costs and higher output prices.

Rotations

In Denmark, on the conventional farms, 57 per cent of the cropped area is under crops grown for livestock (fodder beets, grass grown in rotation or permanently, and grains or maize grown for silage), while on organic farms this was over 70 per cent. This left over 40 per cent for the conventional, and just under 30 per cent for the organic farmers for cash crops.

On the conventional farms half of this was put into spring barley and the rest was divided over winter grains, fodder peas (which are sold off the farm for processing before being used as fodder) and rapeseed, with seven per cent in set-aside. The organic farmer had a similar division of crops, except that less was put in spring grains.

For the purpose of the Australian study, average figures from ABS data for the years 1992-93, 1993-94 and 1994-95 were used. An average for conventional farms in 11 regions was found.

For the organic farms, the conventional rotations in those 11 regions were adapted according to earlier survey comparisons between the two systems. In the study, the organic farmers cropped 61 per cent of the area in crops on conventional farms.

Input costs

In general, both variable and fixed costs are lower on organic than on the conventional farms. The lower variable costs on organic farms are caused not only by lower fertiliser and pesticide costs, but also by lower expenditure on animal-related inputs.

Yields

Yield data in Denmark are shown in Table 1. In 1996, the largest difference in yield between the two management systems was in winter wheat (35 per cent less on organic farms). Spring barley, by far the most popular cash crop, shows a decrease of only 13 per cent on organic farms, and fodder peas (with minimal acreage) an increase of 33 per cent. In milk, less animals per hectare on organic farms (12 per cent) and less milk per cow (six per cent) combined to reduce milk yield per hectare to 17 per cent.

In Australia a yield reduction of 20 per cent on organic farms was assumed for all crops except cotton, where the difference was taken to be 50 per cent. This 20 per cent difference is higher than the survey comparison showed.

Output prices

At present, premium prices of several products are nearly as high as the output price for conventional farmers, almost doubling the output price on organic farms. But for milk production premiums were 30 per cent in 1996.

For the purpose of predicting what would happen with agriculture if many farmers changed towards organic production, it was assumed that premium prices would decrease over time.

In the study, with each one percentage point increase in number of organic farmers the premium decreased by one percentage point.

Output prices in Australia were set at a 15 per cent premium for crops, with no premium for livestock products, as this seemed close to prices found in a survey from the mid 1990s. For the predictions, these premiums were assumed to reduce by 0.5 per cent with every one percentage point increase in number of organic farmers. This assumption resulted in zero premium when 30 per cent of farmers had adopted organic management.

RESULTS

Organic dairy producers in Denmark generally experience lower input costs and somewhat lower yields than conventional producers. But they receive, compared with Australian conditions, a high price premium. This combination leads to higher net farm income on organic farms (Table 2). For conventional farmers, the

TABLE 1: Average yields and ratios (Denmark, 1996)

	Grains spring	Barley winter	Wheat winter	Rye winter	Peas fodder	Milk
Conventional (t/ha)	4.8	5.0	5.9	4.4	3.0	5.253
Organic (t/ha)	4.2	5.0	3.9	4.4	4.0	4.348
Organic/conventional (%)	87	100	65	100	133	83

*\$/litre.

returns to farming were estimated at -\$1600 (after all costs were paid, including depreciation and family labour). For organic producers the returns were \$12,200.

This means that the Danish dairy sector would increase its total returns from farming with an increasing number of farmers transferring to organic management. But when more organic agriculture occurs, output premiums can be expected to drop. The question is: by how much?

In the study it was assumed that the premium decreased by one per cent for every one percentage point of farmers becoming organic.

In other words, if 50 per cent of farmers converted to organic production, the premium for wheat would be half of what it was in 1996 (48 per cent for winter wheat and 16 per cent for milk). Under the above assumptions, the returns to farming on organic and conventional farms are similar when between 40 and 50 per cent of farmers is organic.

Although the assumed grain price is still high at 50 per cent of farmers converting to organic management, the price calculated for milk (the main source of income) is lower than one generally estimates the final premiums to be. At present, about 15 per cent of the market for dairy products in Denmark originates from organic farms. The retail prices are around 30 per cent higher than for conventional products — yet the demand is still higher than the supply.

In other words, price premiums for milk may well keep at the 30 per cent premium level much longer than assumed in this study. If that were to be the case, the profit levels on organic farms would continue to be above those on conventional farms for longer than the 40 to 50 per cent conversion predicted under present assumptions.

On the crop-only farms, where the data were less reliable, organic cropping was more profitable than conventional cropping. But the break-even point was when between 20 and 30 per cent of farmers

TABLE 2: Average returns to farming (Denmark, 1996)

	\$000 per farm
Dairy conventional	-1.6
Dairy organic	12.2
Crop conventional	39.4
Crop organic	42.4

used organic management methods.

In Australia, if 30 per cent of farms were to use organic management methods, the whole of the sector is estimated to lose \$114 million. This is less than four per cent of its total returns. These figures assume no product premiums above conventional prices at all — which is unlikely. In addition, they do not account for part of the lower depreciation costs on organic farms as found in an earlier survey.

Both these matters would reduce the gap between the returns from conventional and organic agriculture in Australia. In fact, the lower depreciation costs on the Australian organic cereal-livestock farms (over \$20,000 on an average farm of 800 hectares) would wipe out that difference of \$114 million.

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