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MARKET CREATION FOR BIODIVERSITY: THE ROLE OF ORGANIC FARMING IN THE EU AND US

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FOREWORD

This report was prepared by Dominic Moran of the Scottish Agricultural College, Edinburgh.

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EXECUTIVE SUMMARY

Organic agriculture has recently seen spectacular growth in many OECD countries and is viewed as an environmentally benign alternative to intensive production. The organics market currently provides one of few conduits through which consumers can express environmental preferences for agricultural practices, and while consumer motives are somewhat confused, both biodiversity and health benefits appear to be prominent. The market is legally segmented from conventional agricultural practices by regulated certification that allows consumers to identify producers and entitles producers access to price premiums. Despite attractive premiums organic supply currently lags behind demand, which is increasingly being tapped by newly emerging alternatives to certified agriculture that can claim to procure similar benefits without the organic certification process. Consumers now face a range of labelling schemes that make competing claims with respect to production processes. Wider participation in organic agriculture and similar integrated farming is likely to dampen exiting price premiums. To allow consumers to discriminate the organic niche may have to be more specific about the benefits it provides. This suggests further voluntary segmentation or a role for the regulatory process to dictate the need for tangible proof that organic claims are valid. If the organic niche is to be encouraged cost considerations and uncertain premiums currently suggest the need for time-limited supply side aid for conversion and the post conversion period.

1. INTRODUCTION

This paper addresses the issue of market creation for biodiversity by means of organic farming[1] concentrating on experience in the EU and the US. Agriculture is a diverse industry that in different ways contributes to, is dependent on and detracts from biological diversity. As a land use agriculture competes directly with habitat conservation. Intensive agricultural practices have long been identified as a source of negative externalities in OECD countries. The realisation that these externalities are actually driven by redundant support policies has led to a global review of what outputs the sector should produce. This switch in emphasis has highlighted the need to internalise external costs and to establish the appropriate balance between the supply of agricultural commodities and the production of other positive externalities such as species and habitat diversity.

Since agricultural support is entrenched in the production patterns of most OECD countries, the policy progression to rebalance support for agricultural commodities with the production of positive externalities has been gradual. In general this means support for more extensive or targeted practices in a programme of agri-environmental management schemes. As a result of political expediency and the belief that there is a demand for environmental public goods, an array of schemes now exist in both the EU and the US that essentially support the production of non market benefits. Biodiversity conservation is frequently included as a stated aim of such schemes targeted at habitat types and individual species.

Organic farming is one way of accentuating the positive external effects of agriculture while producing commodities with desirable consumption characteristics. It is increasingly recognised as one component of the agri-environmental approach and is supported with varying degrees of enthusiasm across the OECD. Biodiversity conservation is one advantage of organic farming systems. Organic systems are generally more diverse than their conventional counterparts and are associated with fewer environmental impacts. But organic farming is only one environmental reference point for the supply of these external benefits. Other low intensity and integrated farming systems are capable of providing similar benefits. However, organic agriculture is slightly different since the agricultural commodity market is maintained as a medium or payment vehicle through which *consumers* in theory can transact for public goods. This is in contrast to government intervention to substantiate public demand by proxy. Put another way, the existence of a carefully segmented organic market partially overcomes the problem of market failure, in particular the problem of transaction costs. Producers supply some optimal bundle of private and public goods and the consumer pays a compensating premium directly to the supplier. To the extent that this market is efficient in delivering what the consumer wants in terms of the mix of public and private good attributes, then a functioning organic market would seem preferable to prolonged government intervention. That this market is slow to evolve suggests some shortcomings in the nature of both supply and demand for organic produce. Organic production is a complex and time-consuming process for producers to undertake. Consumers are often unaware of the market and their preferences for public good attributes still appear to be muddled. This may not be a problem if a market price premium is maintained. However, these information constraints potentially impede the efficient delivery of specific benefits such as biodiversity conservation. This leads to the issue of market creation and the optimal choice of policies that support

1. Alternatively known as biological agriculture. A definition can be found in Lampkin and Measures (1999).

supply, inform demand and generally regulate participation. The organic niches can be considered as a conduit for biodiversity creation but as the market grows the founding ethos of the organic movement is likely to be challenged by the economic realities that characterise other growing markets for complex products. In particular the presence of asymmetric information between buyers and sellers, and producers driven by varying degrees of rent seeking and profit maximising behaviour.

This paper is structured as follows. Section two evaluates the evidence linking organic farming systems to biodiversity. Section three considers the relative profitability of organic systems and conventional agriculture and details some of the supply and demand side drivers behind the growth in the sector. Section four considers the necessary policy instruments to safeguard market development with particular emphasis on the role of regulated certification in market creation. Section five considers the future potential for organic development in the context of agricultural transition. Section six offers some conclusions.

2. BIODIVERSITY AND ORGANIC AGRICULTURE

There are many reasons why people demand organic produce and biodiversity conservation may be one motive. At the outset then, it is worthwhile considering the extent of real benefits procured by this form of production. Discussion of the benefits of organic production can often fail to draw a clear distinction between the private consumption benefits of a rival good (i.e. food) and the positive externalities associated with low intensity production systems. Quantification of the total external costs and benefits of organic systems is still incomplete. Health benefits of organic consumption are questioned, yet these are cited as one of the principal reasons for purchasing organic food (Soil Association 2001). Does it therefore matter that consumer wellbeing is founded on misplaced trust in the integrity of organic produce? With respect to environmental motives, wildlife conservation features prominently in market research of purchase decisions.

A number of key questions arise when considering organic farming as a vehicle for delivering biodiversity benefits. First, what are the biodiversity benefits of switching agricultural systems and are these benefits superior to those from conventional systems? Second, to what extent can support to organic farming be targeted to deliver specific species or habitat targets? Third, however specific the benefits in terms of biodiversity, is the organic option the most cost effective means of delivery? By extension could the same biodiversity benefits be delivered by variant farming methods that integrate some environmentally friendly measure but do not sacrifice any interim or longer-term profits? A final question concerns the evaluation of progress to date. What types of farms have opted into organic schemes and what can be inferred about the biodiversity benefits of this cross section of participants?

Several extensive reviews of the evidence of the environmental impact of organic practices have been undertaken. A report by the UK Soil Association (2000a) identifies 23 studies that investigate the comparative biodiversity benefits of organic and conventional farming. Stolze et al (1999) use the OECD Driving Force, State, Responses framework as a basis for defining their list of physical indicators for a literature review that involves scoring the performance of relative systems in terms of how well they perform with these indicators. The list includes categories flora and fauna, habitat and landscape diversity. Additional indicators of merit include the diversity of domesticated species used in organic systems and soil diversity. Several studies draw links between diversity of the production systems themselves and the diversity as measured in the aforementioned indicators.

Most studies of floral and faunal diversity use a species richness method of quantifying the benefits. In the case of faunal diversity this is typically a count of the number of present beetles, butterflies or bird species. Landscape diversity indicators include fragmentation measures, changes in large-scale areas (woodland, wetlands or meadows), while landscapes include inventories of physical features.

Of the 23 studies identified by the Soil Association review, nine are reviewed in detail. The remaining fourteen studies are consigned to a summary section since the organic comparator under consideration was merely the limited use of agrochemicals as opposed to a *bona fide* certified enterprise. The review does not identify the extent of non-conformity with certification requirements that disqualifies these studies. One can only assume that they fall into the category of “intermediate” or integrated systems. Interestingly there is no commentary on how these experiments perform in biodiversity terms relative to

the fully certified subjects of study. We therefore do not know the extent to which integrated systems can supply equivalent biodiversity benefits. This is an important distinction that again raises the question of where the certification line is drawn. Stolze et al are also somewhat vague about defining what study should and should not be counted in their review as truly organic. Essentially whatever the rigors of UK certification organic farming standards are defined with considerable degrees of variability internationally.

As with comparisons of the relative financial performances some caution is necessary in comparing of the relative biodiversity benefits. If organic farming is the systematic change that is suggested by Lampkin et al then it follows that it is difficult to identify precisely the dose response relationships between changes in a farm system and the production of biodiversity. Notwithstanding these caveats, Stolze et al conclude that organic systems provide (according to their definitions and rating system) more positive effects on wildlife conservation and landscape than conventional farming systems. Data on fauna and flora allow unambiguous support to the relative merits of organic systems. These benefits are measured in the floral and faunal diversity in organic field margins and neighbouring biotopes and in organic arable land and grassland. Furthermore the diversity of cultivated species is higher on organic land. The removal of synthetic fertilisers and pesticides offers greater potential for wildlife habitat creation. Organic farming is considered as the least detrimental form of farming that contributes indirectly to wildlife conservation. Stolze et al note that it is less effective at making a direct (i.e. targeted) contribution to wildlife conservation since essentially this is often inconsistent with any form of agriculture. The Soil Association adds other measures that promote biodiversity and suggests that organic measures can be a more cost-effective method of delivering biodiversity action plans for species conservation. However, many of the practices they advance are not unique to organic systems.

The results of controlled experiments suggest that organic systems are internalising the negative external impacts on biodiversity. It is impossible to say that these benefits are derived solely from certified agriculture. But available scientific research is informative in highlighting the forms of farm management that make a positive impact on habitat creation irrespective of the certified status. It is instructive to take this information and compare it with the profile of farms that are currently opting into supported organic farming schemes. This would provide a basis for identifying gaps that could inform the design of targeted support schemes.

Lampkin et al (1999) report evidence from several EU countries suggesting that the types of farm converting are skewed towards mixed cropping and moderate to low intensity livestock farms, particularly milk production. Specialist cropping farms (arable and horticulture) as well as intensive pig and poultry producers seem to be less attracted by the payment rate. Soil Association (2000b) note adoption patterns skewed towards extensive livestock producers. The limited investigations conducted to date do not cast doubt on the fact that organic production can have lower external impacts and in some cases promote positive benefits. What seems to be more contentious is the finding that these benefits are not necessarily unique to the relatively costly organic process. The question arises then as to the cost-effectiveness of the organic market as a biodiversity policy. This question is of course difficult to determine since organic production is deemed to procure a range of benefits. Moreover, proponents consider that organic systems can compete with conventional systems. Before considering the role of market support therefore, it is worthwhile reviewing the evidence of relative profitability.

3. THE RELATIVE PROFITABILITY OF ORGANIC SYSTEMS

The relative profitability of organic farming systems continues to be a concern to participants in organic agriculture. At present the comparison appears to turn on a belief in sustainable market premiums and the extent of available financial incentives – the conversion and post conversion premiums. This in itself does not invalidate the cost-effectiveness claim of organic proponents, since many conventional systems also rely on support policies. Early profitability studies concentrated on yield comparisons between organic and conventional farms. Lampkin and Padel (1994) argue that absolute yields from organic agriculture are increasing over time but at a lower rate than those on conventional systems. Moreover, the relationship between organic and conventional yields is directly related to the intensity of the prevailing conventional system. Their conclusion is that yield differences have most likely been overstated and that this is partly a result of the way much of the research has been conducted. This research has examined the output effects of variations in individual inputs *ceteris paribus*. This they argue constitutes an approach that is inconsistent with organic farming emphasis on the farm as a whole system requiring complete restructuring. In essence then, the relevant comparison could include a universe of configurations of input intensity in both systems. Comparisons offer only a partial picture. Overall the initial message of this research stressed that organic yields are generally lower but that post conversion variable costs were lower too. More recent research suggests financial parity when looking beyond five years.

As a result of such studies, researchers have been moving away from overly broad, either/or comparisons of the economics of organic versus conventional production systems. Currently, they are more likely to investigate the particular conditions under which an organic system outperforms or simply keeps pace with conventional systems. This shift has come about as organic agriculture has grown from a strictly niche, alternative industry, to an industry of considerable size and enjoying the support of a wide range of constituencies.

Analysis of the economics of organic systems has often been conducted on a partial basis and it is difficult to judge the viability of wholly organic systems. Some of the issues that might inform such a study are reviewed in Box 1., which draws heavily from Welsh (1999). An optimal study would explore the issues of reconciling environmental protection and farm-level safety goals with economic viability and societal expectations of safe, nutritious, and satisfying food. At present, studies examining the financial viability of organic agriculture are perforce more limited. They can, however, provide valuable insights into the economics of current organic production.

Box 1. **Ideal components of studies evaluating the profitability of organic cropping systems**

Involve organic and conventional farm-level workers in the study design, implementation, and evaluation.
The input of farm workers (primary operators, spouses, and hired labour) adds additional realism and accuracy to research. Including these individuals would provide researchers with valuable information regarding the appropriateness of their assumptions, such as the most common organic rotations in an area.

If an experimental design is used, it should enable the statistical comparison of rotations of varying lengths.
Conventional rotations are often shorter than organic rotations. For example in the US Midwest, the conventional corn-soybean rotation is the dominant cropping system. It is important to have information regarding crop yields and net returns, when comparing 3- or 4-year organic rotations with corn-soybean (or other conventional) rotations. In this way farmers can more accurately evaluate their options.

Design experiments as multi-year comparisons of systems.
In order for the rotations to reach their full potential in a number of areas, the experiments should last more than a few years. This is especially important for evaluating systems with longer crop rotations so any benefits from "rotation effects" can manifest themselves. For example, in response to these concerns, Posner and colleagues (1995) established a 12-year trial.

Include realistic organic price premiums in the calculations of economic returns.
Farmers can receive premiums for a number of organic commodities, including corn, oats, and soybeans. The premiums vary and farmers may not always be able to sell all of their organic crops at a premium (Dobbs, 1998b). However, in order to account fully for the economic potential of organic cropping systems, analysts should account for possible price premiums awarded for organic commodities.

Include eligible payments from government farm and conservation programs in the calculations of farm economic returns. Account for policy changes over time.
Payments to organic farmers and conventional farmers may differ because of the difference in the crops they grow. Also, some state conservation payments may differ because of different production practices. Calculating any differences due to differential payments will accurately portray the relative profitability of organic or conventional systems.

In addition to average annual profitability, calculate the net present value of economic returns over time.
The conversion to organic production may require investments in several assets that entail up-front expenses in early years, but may not yield full benefits until later years. Examples include mastering biological pest control, building up soil organic matter, and waiting through a 3-year transition period until the farm is eligible for organic price premiums. This phenomenon may cause net returns from an organic system to be skewed higher in later years. To account for possible skewed returns over time, an investment framework, such as the net present value of returns or annualised returns, is the appropriate method of analysis (Hewitt and Lohr, 1995).

Box 1. *continued*

Include measurements of risk, such as variability of net returns from year to year.
It is often argued that farm households tend to be averse to "downside" risk—that is, the risk of having a bad year financially. Therefore measures of net return variability (e.g., coefficient of variation or standard deviation) should be included in comparison analyses of organic and conventional systems since they can provide critical information to farm households considering a switch to organic systems.

Whenever possible, use actual yield data from surveys or experimental plots.
If yield data from operating farms or controlled experiments can be obtained, this strengthens conclusions drawn from the analysis. Due to the lack of organic agricultural research, modelling yields based on expert opinion or other techniques is less reliable.

Specify the agroecosystem or region where the data for the study were obtained.
The review of studies indicates that the climatic characteristics of certain regions may be important determinants of the relative profitability of organic and conventional systems.

Provide estimates of differences between organic and conventional systems regarding the amount of labour required and how any differences in labour might be allocated among farm household members and hired workers.
Hanson et al (1997) found that organic systems might require greater amounts of family labour. How this additional labour is allocated among family members is important to understanding whether a farm household's goals dovetail with the requirements of an organic production system.

Provide an estimate of possible differences in managerial requirements among the systems under comparison.
Organic systems tend to replace synthetic pesticides and fertilisers with mechanical tillage, crop rotations, and other production techniques for which there may be no readily available information. A conventional farmer may have access to information from an extension service, input supply sales representatives, and a wide range of university researchers. An organic farmer may spend more time and money locating information sources such as other organic farmers, specialised publications, or conferences and seminars Lampkin and Measures (1999). Consequently, it is often asserted that organic systems require a more managerially intensive approach than conventional systems. For these reasons, standard measures of returns to management may not accurately reflect the profitability of an organic system when it is compared to a conventional system. Such speculation needs to be systematically researched and evaluated.

Estimate the economic value of any differences in environmental costs, and health costs of farmworkers, among the systems under comparison.
One of the central criticisms of conventional agriculture and the evaluation of its benefits is that the environmental and health effects of conventional agriculture are not often included in the calculus. Organic systems are often said to be less costly in these areas. Accounting for differences in environmental and farm worker health, and translating these differences into costs and benefits for different farming systems, communities, or society would greatly enhance our understanding of the on-farm and/or social profitability of different production systems.

If post conversion government support is excluded the key factor regarding gross margins is the premium for organic produce. The existence of premiums is what drives similar or higher gross margins from organic farming. Accordingly, the premiums commanded by organic produce appear to be providing some parity between gross margins of both systems. These conclusions are largely corroborated by evidence from other recent studies and reviews of organic profitability. For the US see Welsh (1999), for

EU studies see Offerman and Nierberg (2000), OECD (1999a,b). Colman (2000) considers a third way and points out that many of the external benefits of organic farming can be delivered by integrated methods. These are typically farms managed by environmentally sympathetic individuals unable or unwilling to shoulder the financial penalties of conversion.

Amidst the general bullish attitude towards organic profitability one reality check is the sustainability of premiums as the industry expands Farmers who face the decision to invest substantial amounts of time and money need sound information to make careful decisions. Forecasting the future of the organic commodities and the forces that drive costs and prices is a key factor for anticipating likely trends in market growth. Anecdotal evidence suggests that the costs of growing and delivering organic food are falling as the industry expands. This downward trend in per unit costs should not be a surprise. Business analysts and economists often expect that industry expansions are subject to "economies of size," from the savings that attend such growth. Examples range from economies in production systems, e.g., more effective pest control, to increased efficiencies in transport, e.g., full rail car loads, and to more efficient use of processing plants from larger volumes. If organic agriculture growth is similar to other food industry segments, we should expect to see the production, processing, delivery, and retail costs per tonne, litre, crate, and box decrease over time. The rate of decline is not yet known, as it depends on a number of factors, such as public and private investments in research and development (R&D) in organic systems. To date, such investments have been low compared to investments in conventional production (Lipson, 1997). The key to increasing organic yields, for example, is more R&D for developing and improving organic plant germplasm, pest control, fertilisation, and other system inputs.

4. THE SUPPLY OF ORGANIC PRODUCE

4.1 EU

In contrast with conventional agricultural fortunes, the organic agriculture sector has grown rapidly in both the EU and the US in recent years. In the EU organic production accounted for just over 100,000 hectares or just one tenth of one percent of total agricultural area in 1985. By the end of 1999 the area had increased to 3.5 million hectares or nearly 3 percent of the total agricultural area (see figures 1 and 2). While the output represents a small share of the total food market this area represents a 35-fold increase in 14 years (Lampkin and Midmore 2000). Clearly it is time to consider the impacts of this growing land use.

In the UK the retail value of organic produce was estimated at some £390 million pounds by the Soil Association (2000b). This is expected to grow to some £500 million by 2002. Growth has been uneven across EU states and fastest in Austria, Italy, Sweden and Switzerland. In the UK, growth has been much slower, but even here the figures are impressive. In April 1998 there were around 55,000 ha being farmed organically. By April 1999, the area had almost doubled to 100,000 ha, with a further 175,000 ha in the process of conversion (MAFF 1999). This amounts to an area about 1,2% of usable agricultural area on some 1,500 farms (including holdings registered by certification bodies but not yet notified to UKROFS[2]).

The growth in EU organic production can be attributed to a combination of supply and demand side factors. Both are by definition fundamental to the issue of market creation. However there is as yet little consensus as to whether there should be a proactive government promotion of the sector as opposed to allowing demand to shape the structure of conversion. While this is the case the ability to target support for specific biodiversity benefits is limited.

On the supply side many consider the issue of producer support as crucial in increasing the levels of conversion to and maintenance of organic farming systems. As previously seen organic systems can be configured in many ways, and it is difficult to make direct economic comparisons about financial profitability relative to conventional systems. But early support policies appear to have grown partly from a common belief that organic systems are typically characterised – in a conversion period at least - by lower yields and higher variable costs[3]. Although policies vary, public support is typically extended to cover statutory conversion periods of between two and five years and post conversion area payments. This support and the price premiums commanded for produce are crucial variables in the market creation equation. From a purely demand driven market creation point of view, the issue of the price premium is of particular importance. What producers can expect depends on consumer perceptions and their willingness to pay for organic produce. This in turn depends on perceptions of the attributes of organic produce and the

2. UK register of Organic Food Standards, a statutory accreditation board in the UK set up to set national standards for organic production and processing.

3. In addition Lampkin and Measures (1999) highlight a number of initial transactions costs associated with embarking on organic production.

number of suppliers in the market. Growth of the organics market from the supply side is currently causing some concern among organic pioneers worried about the loss of niche market status and associated value. Specifically the sustainability of both organic claims and the existence of a premium both appear to be inconsistent with the industrial scale production necessary for mass marking. This dilemma needs to be borne in mind when considering market growth of a niche activity. It raises the question of the optimal form of regulation, including the role of certification.

The sustainability of the organic market has not been a major preoccupation of governments to date. The question of how to respond to rising demand has been partially obscured by more pressing policy questions relating to agricultural budgetary expenditures. In the EU organic support has historically been characterised as a mix of specific unilateral activities by several countries against a background of a general policy shift in the objectives of Common Agricultural Policy (CAP) support regimes. A concerted pan-EU approach to organic or biological agriculture has been slow to evolve. Rather, support has varied across states with some (e.g. Denmark in 1987) taking early direct support initiatives and other countries introducing measures on the back of EU extensification allowances (Germany 1989). Pre accession to the EU, Austria, Sweden and Finland had conversion support programmes in place. Support has been both direct (to cover conversion and beyond) plus indirect support to marketing infrastructure, education and advisory services. Some countries (e.g. Germany and Italy) have a regional dimension to their support policies.

International agricultural policy has also been an important window of opportunity for organic market development. In the EU agricultural transition in the wake of the McSharry CAP reforms of 1992 provides a generally favourable climate for the organic market to develop. The thrust of these reforms was a move from commodity support regimes to an era of decoupled support mediated through an agri-environmental policy. This move is part of a process that is slowly redefining the aims of the agricultural industry and the role of farmers as environmental stewards and providers of public goods. There is then a general tendency for industry practices to become convergent with the general principles of organic farming[4]. The overlap between agri environmental policy and the objectives of organic farming provides a favourable policy environment for growth witnessed across the EU and to a lesser extent the US. Agri-environmental provisions are increasingly being modified to accommodate the growing demand and the desire amongst producers to convert to organic production. Interdependence between organic support and agri-environmental provisions will increase as countries allow support to be combinable with new of pre existing legislation at regional or even local levels.

Lampkin and Midmore (2000) note that of the growth in production since 1985, 70 percent has occurred in the six years following the implementation in 1993 of EC Regulation 2078/91, which defined legal standards for organic crop production and thus encouraged European trade in response to rapidly increasing demand for organic food. EC regulation 2092/91 made certification of organic produce a legal requirement (see below). EC Regulation 2078/92 consolidated (2078/91) as part of the agri-environment programme supporting conversion to and the continuance of organic farming methods. This regulation covered the introduction of conversion support. Around half of EU member states had introduced support in years prior to this. But the UK (in 1994) plus Netherlands, Portugal, Spain and Ireland all introduced schemes that differ in detail and more importantly (to explain figure 2) in amounts offered. It is important to note the complexities of the conditions attached to payment rates across EU states. Estimating the impact of organic support in isolation is complicated as organic provisions are made conditional on

4. Commodity support reform is also consistent with the objectives of international trade regimes under the WTO (previously GATT). Note that adherents to the early philosophy of organic farming often advocate different trade objectives for organic movement enshrined in eco-regionalism or local exchange. Ironically the trade in organics is booming because of insatiable demand. Products are now routinely transported thousand of miles to retail outlets. The full costs of this transportation are rarely signalled to consumers.

participation in other schemes or permitted to be combined with other form of regional development assistance. The Organic Aid Scheme[5] in the UK proposed conversion payments on an area basis for a five-year conversion period. The eligibility criteria and the amounts are detailed in Lampkin and Measures (1999)[6] but the expenditure on the scheme is considered modest when compared to the total budgetary costs of implementing the CAP in UK (Colman 2000). Spending in the UK is expected to rise significantly to £137 million in the seven years covered by The England Rural Development Plan 2000-2006 under Agenda 2000[7] (see below). This can be a seen as a sign of commitment to the objectives of organic farming. It is also a result of pressure caused by the almost immediate uptake of provision made in the revised 1999 aid scheme.

This high demand raises the question of the appropriate rate of conversion incentives and whether there is some optimal level. This question can really only be answered by a detailed comparison of the returns to conventional and organic agriculture. In addition the rate would ideally be set with some understanding of the price premium that producers can expect post conversion. By extension this premium depends on the economies of scale arising from market growth, which itself relates back to demonstrable demand. Understanding this circularity is currently hampered by the absence of key data on the organics market. But the viability of conversion will surely be compromised by the growing extent of foreign trade in organic produce that links high demand markets lower cost non-indigenous producers.

The reforms since 1992 have provided an agri environmental window for organic development if not a specific route map for member states to follow. Rather, policy development has been discretionary leading to different growth patterns across EU states. Some countries have set up action plans and specific targets for arable area to be dedicated to organic production. As things stand, the presence of conversion support is an important incentive that reduces the risk of relying on premium prices. This is important to bear in mind in the case of countries contemplating the potential of organic production without the benefit of the policy background described here. Lampkin et al (1999) echoes this view reviewing the implementation organic support under Agri environmental of 2078/92. They note that although there are demonstrable environmental benefits, financial returns are dependent on marketing opportunities and the extent of policy support. They also note that market development is determined by the presence of post conversion support schemes. The UK is currently one of only two countries that do not offer post conversion support. This failure is thought to be retarding growth of the sector and there appears to be some justification for support using the same public goods arguments that justify ESA schemes or other extensification schemes permitted under agri environmental rules.

4.2 Agenda 2000

As rural policy refocuses its objectives Agenda 2000 augments the agri environmental reform programme with additional objectives of accession by non EU states and an emphasis on rural development. The rural development regulation (EC Regulation 1257/99) calls for member states to consolidate rural development objectives in specific plans or programming documents. At the same time all existing agri environmental funding and other rural development and structural funds are being brought under a single umbrella of integrated rural development plans. Like its predecessor, agenda 2000 provides extra validation of an organic approach. Specifically there is much in EC 1257/99 that will a positive impact on market development. However, it is important to note that apart from the preamble to The Rural Development Regulation, Agenda 2000 does not specifically mention organic farming. This is something

5. In 1999 revised and renamed the Organic Farming Scheme

6. Rates for other European countries are detailed in Lampkin et al 1999.

7. Agenda 2000 is the programme of reform of European agricultural support.

of a missed opportunity. It also seems likely that funds currently allocated to the environmental agenda will be squeezed when the true costs of accession are known.

To summarise, market development in the EU owes much to proactive support and a favourable policy environment. Support instruments have been implemented at different times across Europe and at different rates. Emphasis on decentralisation and subsidiarity suggest that market development will not be a harmonised agenda across Europe with more rather than less variability in the conduct of support programmes to the organic sector. Demand remains strong and price premiums – while they last - are an incentive to convert in all countries. While this suggests the potential for a free market, there is no indication that government support will be withdrawn from any scheme.

4.3 US

In contrast to the EU, the level of conversion in the US is more modest, with 544,952 hectares across 49 states being under certified organic production in 1997. In the same year, the organic market in the U.S. totalled $4.5 billion. This difference is partly due to the lower availability of supply support and the fact that US supply has to search out and respond to more remote pockets of demand. Transaction costs – the costs of matching suppliers and consumers - are therefore a significant problem for producers wanting to enter the market.

Government efforts to boost organic production have focused mainly on developing national certification standards to assure consumers of consistent product quality and on streamlining interstate commerce in organically grown products. These efforts culminated in the announcement by USDA of a uniform national standard in 2000 defining the term "organic" for both bulk and processed products and at all stages of production and marketing. These supplemented regulations in the Organic Foods Production Act of 1990. USDA has been promoting organic exports for several years. A pilot program to offer organic crop insurance is under development. Several other USDA research programs have focused on organic and sustainable farming systems since the 1990's, and more such programs are taking shape.

By 1997 forty organic certification organisations, including a dozen State programs, conducted third-party certification of organic production. Several States have begun subsidising conversion to organic farming systems to improve the environment. In Iowa, organic crop production has been an approved State conservation practice since 1997, and is eligible for cost-share support from USDA's Environmental Quality Incentive Program. In Minnesota, the Department of Agriculture implemented an Organic Cost Share Program in 1999, which reimburses Minnesota producers for up to two-thirds of the cost for organic inspection and certification. Also, several State-run certification programs charge only nominal fees. A study by Lohr, and Salomonsson, (1998) suggests that these State incentive payments may compel growers who are already interested in organic production, but more obstacles need addressing to attract most large producers.

President Clinton’s fiscal 2001 budget proposed $5million for research to develop improved organic production and processing methods.

In summary, public support in the US has focussed predominantly on indirect support. Were direct support to become a policy objective the US has some opportunity to learn about the supply response of differing EU approaches.

5. DEMAND SIDE

Recent food scares and changing consumer preferences have fuelled a boom in consumer demand to the extent that the current situation can be characterised as one of excessive demand over supply of organic produce. The U.S. and the European Union are the world's largest markets for organic products, each with between $4 billion and $5 billion in sales respectively in 1997. In the UK the retail value of organic produce was put at £390 million in 1999 with a large proportion of the supply shortfall being made up by imports. Most estimates project annual increases in the U.S. market of 15 to 25 percent until the middle of the next decade (Richman, 1999).

Consumers worldwide have consistently been willing to pay premium prices for organic products (Lohr, 1998). Surveys and studies indicate that consumers buy organic products because they believe that in doing so they help to protect the environment, while safeguarding their own health and that of farm workers (Blobaum, 1997; Tate, 1994). Other purchasing motives include animal welfare concerns and the view that organic purchases provide a link to the viability of idealised rural communities or an antidote or reaction to increasing market concentration among retailers or multinationals. The latter has its greatest expression in the continued popularity of organic box schemes and forms of direct purchase such as farmers markets, which are enjoying a renaissance in the UK. Some of these reasons are undoubtedly rooted in the persistence of the philosophy that underscored the origins of the organic movement and which some advocates long to maintain. But it is increasingly apparent that many of these ideals will be stretched by market growth either through the involvement of large retailers or as a result of the inexorable globalisation of agricultural trade.

Whatever the motives, demand has reached sufficient proportions along the supply chain and food manufacturers and supermarkets readily pay farmers premiums for organically produced commodities. Supply shortfalls are now leading some supermarkets to extend conversion support directly to suppliers.

Most demand forecasts appear to extrapolate past data and the informal nature of much of the early market development in all countries means that data on price and quantity or purchases has been scarce. Thompson (1998) notes the absence of data to estimate own price, cross price and income elasticities. In this situation it is difficult to model future scenarios to see the impacts on price premiums.

This information gap is being partly rectified as supermarkets chains employ sophisticated market research polls and, increasingly, their own scanner and reward point data to derive an understanding of the nature of their market. The same supermarkets are undertaking detailed marketing work to understand the profile and motives of their consumers and what they want. Most retailers are reluctant to go public with this information, as it is central to their operations on sales and purchase of inputs. Clearly though, demand is reaching a sufficiently critical mass for them to include organic inputs in their manufacturing processes. The demand is of course only a derived demand as consumer tastes and preferences have to evolve to provide the signs of what they actually want. Krissoff (1999) notes that a remaining public policy challenge in the development of demand is to determine whether or not consumers are attaining the environmental and food safety attributes that they associate with organic products. As noted, willingness to pay has different motives not all of which are verifiably quantifiable. As consumers become more discerning the role of labelling and certification will come increasingly under the spotlight with further potential to segment the market to deliver more specific environmental benefits.

6. INCENTIVES

Despite comparable financial returns and the available price premiums other market hurdles may be hindering market growth. In the UK several empirical studies have attempted to explain adoption or abandonment of organic practices or certification Burton et al (1999); Rigby et al (2000); Rigby and Young (2000).

As evidence Rigby and Young (2000) suggest that from a sample of farmers initially registered for certification with the Soil Association but who later abandoned organic farming, two subgroups emerge. Those who could not sell their produce or could not get a premium sufficient to cover the additional cost of production and those who, motivated by lifestyle considerations or other ideas, started up in organic production with little experience and knowledge, and subsequently failed to make a sufficient living. The reasons for ceasing organic production identified by survey respondents can be grouped into 4 main categories:

1. Marketing and market incentives (problems marketing to far from suitable outlets such as processors or wholesalers for economic viability).

2. Cost issues.

3. Agronomic problems (including access to technical information).

4. Other (including changing personal circumstances).

Issues 1 and 2 are closely related in the failure to realise premiums. Agronomic issues and over optimistic expectations is symptomatic of either poor access to or non-use of available advisory. In general, advisory, marketing costs and difficulties in finding outlets are barriers that suggest the need for more indirect support to the industry. The division of public support between direct and indirect assistance to the sector varies considerably across EU countries and US states. In the UK demonstrable demand but limited supply has led some retailers to facilitate the support function. Supermarkets can facilitate the development of the organic market by helping to minimise the risk to producers. One method is through providing financial support for conversion. In the UK the supermarket chain ASDA is supporting livestock conversion under its meat conversion scheme worth £3million. Further up the marketing chain, four major abattoir wholesalers have provided loans to the major organic meat marketing operation in the UK – the Organic Livestock Marketing Co-operative (OLMC) - to improve and develop consistent supplies. .

Another method of support is through the use of long-term forward agreements on volume and price. Here the negotiating position of suppliers is likely to be enhanced if they are in co-operatives. A strong producer co-operative in the UK (OMSCo) has enabled the establishment of a sustainable marketing framework for dairy producers negotiated a lucrative fixed term five year contract with Sainsburys for premium price organic milk. This price agreement has become a benchmark price in the dairy industry, with similar prices being offered by the majority of organic dairies. The existence of a fixed price agreement lessens the fear of downward pressure on prices and has lead to buyers offering additional support to members of co-operatives through advisory and conversion support. The development of co-

operative arrangements between producers is seen as one way to maintain some market power faced with the inexorable downward pressure on prices likely to derive from supermarket mass sourcing and imports.

While demand remains strong there is good potential for deals of this nature between retailers and suppliers. All such deals provide depth to the market. Apart from these arrangements for commodity supply there are few other opportunities for market creation. One interesting exception is the market for low intensity agriculture in water catchments used for drinking water supply. Lampkin et al (1999) report arrangements in Luxembourg where the water body for Redange Municipality pays local farmers a rate of 220 ECU/ha for water protection purposes. In Germany water companies in Augsburg, Dortmund, Gottingen, Leipzig, Munchen, Osnabruck, and Regensburg all operate organic support schemes on the rationale that rates of payment are less expensive than the cost of nitrate and pesticide removal from water supplies. In the UK Wessex Water introduced a similar payment scheme in an attempt to meet statutory nitrate concentrations in groundwater sources (ENDS 1999). The scheme only stated that payment was for farmers to use "more natural methods of farming". But since administration of the scheme was handed partly to the Soil Association, the requirements effectively became those for certified organic farming. The £40/ha payment is considerably less than the rate in Luxembourg and recent indications are that the uptake has been negligible. This suggests that the payment is too low. An interesting feature of the arrangement is that it is partly funded by the proceeds from another environmental economic instrument the landfill tax credit scheme. This scheme allows a tax allowable percentage of the landfill tax liability of landfill operators to be earmarked for environmental purposes[8]. Since five other water companies also operate waste management facilities there is some potential for this scheme to be expanded.

8. Landfill tax was introduced in the mid-nineties as an incentive for landfill operators to reduce waste disposed of by burying it in the ground. However, a means of reducing this tax liability whilst benefiting 'good causes' was conceived: if landfill operators give 20% of their tax liability to environmental projects, the Inland Revenue refunds 90% of that amount to the company. This means that the operators can fund 90% of a project's cost, and the remaining 10% is sought from a third party, to encourage joint partnerships.

7. CERTIFICATION

Certification is a form of labelling that allows consumers to identify organic produce and producers to seek higher premium prices. The process creates an identifiable market segment for goods produced in a certain way and can be considered as a necessary prerequisite for market creation. Certification is also likely to be a means of accessing support regimes as well as to level the playing field for international trade in organic produce. Adherence to EU requirements (2092/91) restricts access in the UK to the Organic Aid Scheme. As noted by Lohr (1998), with expansion of markets, distance and time increase information asymmetry about products. Consumers have greater difficulty determining the origins and production methods of goods they consume. The evolution of multiple labels with differing certification requirements has given rise to accreditation schemes. The accreditation role is to oversee the standards used by national certification bodies.

The UK Register of Organic Food Standards (UKROFS) is the statutory regulatory body that licences certifying bodies such as the Soil Association. Standards have been recently harmonised in the US. At the international level the International Federation of Organic Agriculture Movements (IFOAM) accredits national certification schemes to facilitate trade. In addition *Codex Alimentarius* is a joint commission of the Food and Agriculture Organisation and the World Health Organisation of the United Nations. The commission approves international guidelines for the production, processing, labelling and marketing of organic foods. The aim here is for a supranational (or trade block) code of conduct, again to facilitate trade arrangements.

In general the costs of attaining certification -as opposed to those incurred by the interim conversion losses- do not appear to be excessive. As with support policies, certification schemes and regulatory architecture have been country specific (see Lampkin et al 1999). Much of the original impetus for certification in many countries has grown out of an original niche movement that has matured with differing degrees of support and maintained control of the rules of the game. However as the sector grows, and with increasing trade in organic produce, there are questions about the need for internationally recognisable certifications standards (for consumers); for a common understanding about the extent of organic certification standards as currently applied, and for how standards should shift to accommodate technological change in agriculture. The last two points refer to the question of where to draw the certification line. This question seems to be a point of contention between organic farming pioneers and those that now welcome wider retail involvement (and general democratisation) and all the necessary processing of produce this entails[9]. Growth of the market depends on wider retail involvement and the industry's ability to deliver a consistent range of products. This in turns suggests the need for standards to adapt to new means of delivering processed foods.

9. Rapid growth in demand relative to supply and resulting imports has accentuated some of these conflicts. In particular the paradoxical status of imported produce that has been transported across continents raises the question of labelling these extra environmental externalities as part of the certification process. This debate has extended to social and ethical criteria of source countries.

The issue of certification thus encapsulates many of the conflicting issues in organic production. The system appears to be contestable and this is worrying the incumbents. Apart from the requirement to accommodate new production methods, other forms of labelling are competing for space. For example the UK Farm Assurance Schemes are a form of labelling used to signal minimum practices used by farms that supply certain retailers. Such labels have some potential to rival certified organic produce in the eye of the consumer. From the supply side these schemes may or may not be providing the equivalent levels of external benefits that are claimed to derive from organic systems. However from the demand side they essentially segment the market still further by cashing in on the muddled set of motives that a section of consumers have for their WTP. This diverts demand from genuine organic produce and there is currently little evidence to suggest that consumers are distinguishing between the benefits on offer. Such schemes raise the proprietary question about access to market price premiums. But to restrict standards may be to deny market expansion and legitimate compensation for the production of positive externalities in favour of protecting the consumer. This again highlights the basic dilemma about what organic production is actually for and societal priorities for the delivery of food commodities relative to other external benefits.

This debate raises the issue of harmonisation of standards or the general acceptance of equivalency across standards. Krisoff notes that the economics of harmonisation are ambiguous. A single standard can reduce the cost of seeking information by protecting consumers from false claims. The same protection will be provided to growers and retailers in sourcing and selling transactions. However, the eclectic socio economic and philosophical origins of organic production provide some legitimacy to differing claims about what should constitute legitimate standards. These claims are so diverse as to complicate the feasibility of setting agreed standards. Moreover, the existence of multiple standards allows producers and consumers to capture welfare gains from these different organic characteristics. The downside is that they increase production and marketing expenditures and occasion higher certification expenditures. How consumer purchases change at the margin in response to harmonised standards remains to be seen. Currently certification represents a necessary barrier to the size of the organic market. But standards are likely to come under pressure as new entrants with limited commitment to organic principles seek access to premiums. This pressure could reduce the integrity of organic produce in the eyes of the consumer. This is particularly true of the segment of consumers who do not have strong motives for seeking out and verifying information.

8. SUMMARY AND CONCLUSIONS

Low intensity farming systems can be configured in a number of ways to deliver public goods including biodiversity benefits. The principal thrust of EU and to a lesser extent US agri-environmental policy has originated in supply side imperative of reducing costly agricultural surpluses and simultaneously rewarding the providers of public goods. The absence of a market for the latter provides the rationale for government intervention. In the absence of markets, transaction costs (obtaining information, establishing and enforcing contracts) are too high. Although some consideration has been given to the quantification of the demand for these public goods, the methods used to measure preferences are largely hypothetical.

This form of demand assessment is largely an attempt at an ex post cost-benefit validation of policy support to providers. Prevailing property rights mean that government assures supply using a provider gets policy.

Organic farming is one low intensity configuration that has come about largely because of a change in demand for the attributes that consumers feel can be embodied in organic commodities. It is difficult to separate shifts in demand for the excludable and non-excludable good attributes in organic products. The important point is that the demand for rival goods (i.e. food) leads to joint production of public goods, which to some extent obviates the need for government intervention using agri-environmental policy support measures. The market exists and provides biodiversity benefits. It does not need to be created but there is a question about appropriate policies to nurture it. Consumers are currently expressing a taxonomy of motives from personal and altruistic health (consumptive use values) derived from safe and wholesome food, through to bequest and existence values related to rural cohesion. Most emphasis has been on the former but increasingly the latter reasons are featuring, as motives consumers will want to transact through organic produce.

Organic production and the growth in retail sales value have been impressive over the last decade. Originally small, the market is growing as more retailers decide to supply organic produce and make arrangements that deepen the market and provide producers and other agents in the supply chain with some certainty about market outlets at more or less guaranteed prices. From informal beginnings in most countries this practice has been formalised and is now a legally segmented market that delivers joint public and private benefits to consumers. The certification process provides a signalling function and is central to the definition of the organic market. Certification is the principal regulatory instrument that defines the operations of participants who have chosen to operate at or above a reference level of environmental quality in return for access to a restricted market that has demonstrable premiums. Certification lowers transaction costs for any other agents that might want to contract on other external benefits from low impact farming. Water companies were highlighted as an example.

The environmental reference level that defines certification is an important constraint on activities of organic producers. How this constraint is met by different production systems is currently a point of contention amongst organic proponents. For market growth, certification has to be flexible to allow the adoption of technological change without losing the integrity that is associated with organic production methods. The existence of premiums is what has allowed market growth in countries operating different supply side support policies. But the longevity of premiums in a growing market is now causing

concern. The participation of large retailers will inevitably concentrate buying power and increasingly dictate prices, production methods and possibly in the end, standards. Some supermarkets currently stand accused of "stealing the story" from the grass roots. It is difficult to predict how greater retailer involvement will influence the production of biodiversity benefits on-farm. However, one can speculate that there are untapped productivity gains to be achieved from this changing industrial profile. Coupled with pressure for progressive certification one can assume downward pressure on premiums in many countries. This trend has definite policy implications for the nature and duration of support to organic participants

Policy on organic production and market develop has been mixed. The objectives of organic production dovetail with an on-going structural shift in conventional agriculture. This shift is caused by the reorientation of government support to the sector. To the extent that the objectives of this shift converge with organic ideals then there is an argument that justifies seeing organic farming as an extension to the range of schemes that come under the agri environmental umbrella. The pull of market demand is increasingly being supplemented by support policy push, a development that appears to be welcomed by organic proponents. These groups maintain that the absence of support essentially handicaps market development. Without support converters appear to be being made to adopt the risk in the expectation that premiums are eventually attainable. Only the better off producers could shoulder this risk. The absence of post conversion support suggests unwillingness on the part of government to buy down that risk in the longer term or a belief that premiums are a sustainable incentive. This attitude is, however, under review with most governments realising that support may need to be concerted mix of direct (conversion and post-conversion) and indirect support relating to advisory, education and marketing support. Indirect support appears to be particularly important for overcoming information deficiencies among consumers and producers. The direct support may need to be targeted at a post conversion period. However, given the uncertain nature of demand it would be prudent to make this commitment subject to a specific time period.

Despite high demand it is difficult to forecast the shape of the market because transactions by organic pioneers did not lend themselves to data collection and current retailer activity is concealed as part of a strategy to determine and gain a market position. Most demand information drives from opinion polls. The absence of data means that important economic parameters are unavailable. The price (premium) and quantity consequences of any policy to deepen the organic market are therefore uncertain. Premiums are likely to be eroded by large scale production and may only be sustainable by further market segmentation as organic consumers look for further links between their underlying motives and production guarantees evidenced in more detailed certification and/or labelling. Countries entering organic markets from outside the OECD are less likely to benefit from the supply side policies that have fuelled growth in these countries. If domestic demand is not strong in these countries then market development will depend on export opportunities. These countries may be price competitive if input costs are lower and they may be able to penetrate existing markets that are slow to develop their own supplies. Promotion of an organic sector in these countries is likely to be through indirect aid to education, advisory and marketing. Countries will also have an advantage if they can offer niche products due to climatic advantages and add value at low cost. In the longer term organic systems appear to be as financially viable as their conventional counterparts.

The biodiversity benefits of organic agriculture are proven although they cannot be considered unique to this form of low intensive production. Support to the sector directed solely for biodiversity objectives would be unwarranted. As it is support schemes have led to rates of participation that are disproportionately skewed towards extensive livestock and dairy producers and by extension certain habitat types. The use of supply side policies suggests that targeted support may be an option to equalise habitat benefits of organic farming. However, the need for support through period of 3- 5 years of conversion suggests that this may not be the most flexible approach to biodiversity policy. Because consumer motives are complex, the utility part weight or specific WTP for biodiversity conservation as

part of an organic purchase has not been explored empirically. As yet, there is little indication that specific benefits – beyond more evident health benefits – are used in marketing as more direct links or organic niches to catalyse demand for habitat and species types. However there is no reason for this or any other benefit category within the organic motives set not to evolve as a marketing niche within a niche in much the same way as animal welfare or regional identity has featured in retail marketing strategies. This would appear to remain untapped area of market research.

REFERENCES

Blobaum, R. (1997) The Worldwide Expansion of Organic Farming: Its Potential Contribution to Sustainable Agriculture. In: J.P. Madden and S. Chaplowe (eds) For All Generations: Making World Agriculture More Sustainable. Glendale, CA – OM Publishing- pp 122-142.

Burton, M, Rigby, D., T. Young (1999) Analysis of the Determinants of Adoption of Organic Horticultural Techniques, Journal of Agricultural Economics, vol. 50:1, pp 47-63

Colman, D.R. (2000), Comparative Economics of Farming Systems, Chapter 5 in: Shades of green: a review of UK farming systems, P.B Tinker (Ed) Royal Agricultural Society of England

Dobbs, T. (1998) The Price Premiums for Organic Crops, Choices 13(2): 39-41

ENDS (1999) Wessex offers farm subsidy to cut nitrate leaching, ENDS 279

Hanson, J, E. Lichtenberg, S. Peters (1997) Organic Versus Conventional Grain Production in the Mid-Atlantic: An Economic and Farming System Overview, American Journal of Alternative Agriculture, 12(1): 2-9

Hewitt, T. and L. Lohr (1995) Economic and Environmental Simulation of Alternative Cropping Sequences in Michigan, Journal of Sustainable Agriculture , 5(3): 59-86

Krissoff, B (1999) Emergence of U.S. Organic Agriculture – Can we compete? Discussion American Journal of Agricultural Economics, 80:5 pp 11309-1133

Lampkin N. and Peter Midmore (2000) Changing Fortunes for Organic Farming in Europe: Policies and Prospects, paper presented at the Annual Agricultural Economics Society Conference, Manchester University 14-17 April

Lampkin N., S. Padel (eds) (1994) , The Economics of Organic Farming: An International Perspective, Wallingford, CAB International.

Lampkin N., Foster, C. Padel, S. and P. Midmore (1999) Organic Farming in Europe: Economics and Policy, volume 1, The Policy and Regulatory Environment for Organic Farming in Europe, Universität Hohenheim

Lampkin, N and M. Measures (eds) Organic Farm Management Handbook (1999) University of Wales, Aberystwyth, Elm Farm Research Centre

Lipson, M. (1997) Searching for the "O-Word": Analysing the USDA Current Research Information System for Pertinence to Organic Farming Santa Cruz, CA.: Organic Farming Research Foundation

Lohr, L. (1998) Implications of Organic Certification for Market Structure and Trade, American Journal of Agricultural Economics, 80: 5. Pp 1125-1129

Lohr, Luanne and Lennart Salomonsson. 1998. *Conversion Subsidies for Organic Production: Results from Sweden and Lessons for the United States*. Athens, GA: University of Georgia, Dept. of Agricultural and Applied Economics. Faculty Series no. 98-04.

OECD (1999) COM/ENV/EPOC/AGR/CA(99)46/REV1 Comparing profitability of organic and conventional farming: the impact of support on arable farming in France.

OECD (1999) COM/ENV/EPOC/AGR/CA(99)45/REV1, The effect of support measures on the profitability of organic farming relative to conventional farming: a case study for the Netherlands.

Offerman, F. and Nieberg, H. (2000) Profitability of Organic Farming in Europe, paper presented at the Annual Agricultural Economics Society Conference, Manchester University 14-17 April

Posner, J., L. Michael, D. Casler, J. Baldock (1995) The Wisconsin Integrated cropping Systems Trial: Combining Agroecology with Production Agronomy, in: American Journal of Altenative Agriculture, 10(3): 98-107

Rigby, D. T. Young, M. Burton (2000) Why do farmers opt in or out of organic production? A review of the evidence. Paper presented at the Annual Agricultural Economics Society Conference, Manchester University 14-17 April

Rigby, D. and T Young (2000), Why do some Agricultural Producers Abandon Organic Production Systems? An Exploration of UK Data, mimeo, C.A.F.R.E., School of Economic Studies, University of Manchester

Soil Association (2000) The Biodiversity Benefits of Organic Farming, Soil Association and WWF.

Soil Association (2000b) Organic Farming: Written evidence from the Soil Association to the Agriculture Select Committee, October 2000

Soil Association (2001) New report presents evidence for health benefits of organic food – press release 6th August

Stolze, M., Piorr, A. Häring, S. Dabbert (1999) Organic Farming in Europe: Economics and Policy, volume 6, The Environmental Impacts of Organic Farming in Europe, Universität Hohenheim

Tate, W. (1994) The Development of the Organic Industry and Market: in: An International Perspective. Lampkin N., S. Padel (eds) (1994) , The Economics of Organic Farming: An International Perspective, Wallingford, CAB International. Pp 11-26

Thompson, G (1998) Consumer demand for Organic foods: what we know and what we need to know, American Journal of Agricultural Economics, 80:5 pp 1113-1118

U.S. Organic Agriculture Gaining Ground," *Agricultural Outlook*, April 2000.

USDA Report on the Status of U.S. Organic Agriculture - March 2000
http://www.ers.usda.gov/whatsnew/issues/organic/

Welsh, R. (1999) The Economics of Organic Grain and Soybean Production in the Midwestern United States, Henry A. Wallace Institute for Alternative Agriculture

Figure 1. **European area in organic production**

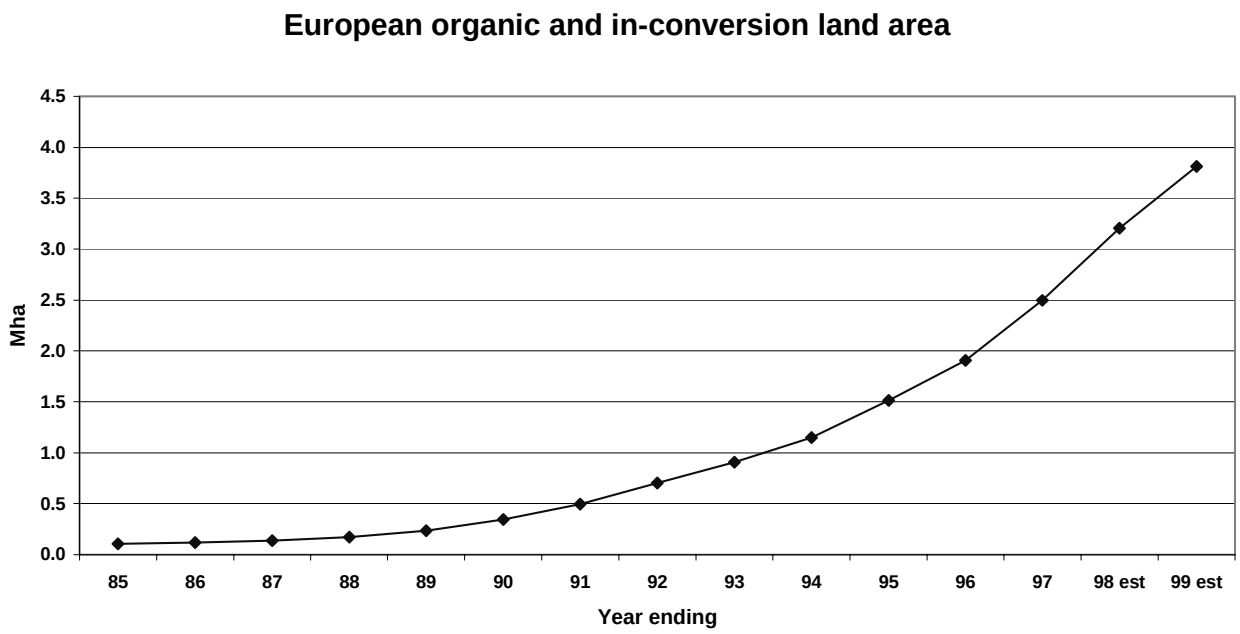

Figure 2. **Comparing the growth in organic production (% of useable agricultural area) 1993-1999**